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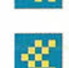
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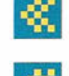
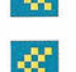
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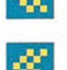
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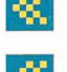
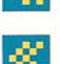
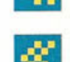


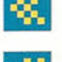

















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AUGUST 1993

FEATURES

HANDS ON



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Editor's letter

When an Acorn A540 is used to edit TV programmes, like BBC's *Watchdog* or Channel 4's *Dispatches*, then you know there must be an impressive application at work behind the scenes. The application in question is known as *Optima* and gradually making its mark in the TV world.

Then take that same piece of software and cut out the parts that are only useful to a professional programme maker. Finally, cut the price to fit the demands of a school or home budget and what do you get? Turn to page 29 to see our verdict.

Karen Dunaghay

EXCLUSIVELY PRODUCED ON ACORN MACHINES
All the editorial pages in *BBC Acorn User* are produced using Acorn computers, Computer Concepts' *Impression 2*, LaserDirect printers and Taxan monitors



The ideA range

ICS was the first company to offer IDE products for Acorns back in 1990; now they are the standard choice for new Acorn computers. Building on three years' experience we have continually improved our IDE filing system. It now offers the highest level of RISC OS compliance, and compatibility with at least 45 different hard discs tested by us. Can any other supplier make this claim?

Our IDEFS abolishes the RISC OS limit of 512 Mb, and offers extra features such as password protection, background operation, disc partitioning, and power saving (which allows some discs to stop spinning when idle).

Partitions can have different levels of protection. Family or pupils can access some of your files while you keep others safely out of their reach. Or you can simply protect the whole disc (reformatting is not required for this).

Our hard disc upgrade kits are based around two internal interfaces at present: IDEA3IN for the A3000 Series, and IDEARCIN for the A300/A400/A500 Series. All kits are designed to a high standard and include all the parts you will need.

IDEA3IN upgrade kits include an I²C expansion socket as standard. They come with a 2½" disc already attached, and are easy to fit once you have opened up your computer. False rumours have been spread in the past (by sellers of SCSI hard discs) that internal upgrades might not be safe in an A3000. In three years we have never heard of an actual problem, but please ask Acorn's Technical Department if you wish to be reassured.

IDEARCIN upgrade kits provide a fast 16-bit link all the way from the computer to the hard disc. They can even be fitted to an A310 without a backplane – quite a cost saving. A second hard disc can easily be added later if required.

Interfaces and hard discs can also be bought separately. By shopping around you may even save a few pounds. But beware: not all IDE hard discs work with all interfaces, and if you have a problem it may be difficult to decide who should put it right. We recommend buying a complete kit from one source.

WIZZO is the name given to our IDE filing system when it is supplied as a single rom chip. Wizzo5 is for the A5000, and Wizzo4 is for the A4. You should buy a Wizzo if you need password protection or wish to use larger hard discs. (Wizzo4 has been delayed slightly – we are adding a feature to ensure compatibility with possible future A4 upgrades).

A Wizzo rom by itself will only produce a slight speed improvement. If you need speed in an A5000, fit an IDEARCIN interface instead. Up to 60% improvement can then be achieved, but this does depend which hard disc you use so do check with us first.

How to read our ideA product references

A number at the end is the nominal hard disc capacity in megabytes. We usually round this down, so the actual formatted capacity may be higher. All discs have auto-parking. Average access times vary but all are below 20 ms.

All prices shown exclude VAT and are subject to change without notice. The cost to us for hard discs can vary enormously from week to week – not always downwards! Your local dealer can obtain *ideA* products from us or from a distributor.

Archimedes A300/A400/A500 Series Internal Upgrades

Package includes formatted hard disc, ideA interface card, hard disc cradle and fittings, fan kit, replacement multi-purpose LED (power and drive status), manual with fitting instructions. Can be fitted to an A310 without a backplane. If a backplane is used it must be a 4-layer type. Easily fitted by most users.

IDEARCIN 80	£225	IDEARCIN 240	£425
IDEARCIN 100	£255	IDEARCIN 330	£500
IDEARCIN 120	£275	IDEARCIN 426	£575
IDEARCIN 170	£305	IDEARCIN 540	£799

A3000 Series Fully Internal Upgrades

Package includes formatted hard disc mounted on ideA interface card, manual with fitting instructions. Fully internal, using internal expansion slot. Co-exists with floppy drive and memory upgrades. Fits the new 1992 computers. Easily fitted subject to Acorn warranty stipulations.

IDEA3IN 40	£225	IDEA3IN 120	£350
IDEA3IN 60	£275	IDEA3IN 130	£450
IDEA3IN 80	£325	IDEA3IN 209	£499
A3000 FAN KIT (not usually required*)			£19

**Only required if the computer has been fully upgraded, e.g. with maximum memory AND Econet AND an external podule.*

Separates for hard disc upgrades

We can only guarantee the performance of ideA interface cards with hard discs we have tested ourselves, so please check if in doubt. If you are buying a hard disc for an A5000 please say so. If you intend to fit the disc in addition to an existing one we need to know the make and model of the existing disc. Acorn's interface does not support all makes of disc, and some models will work as a second disc but not on their own.

Hard discs on their own are listed as, for example, IDEA 80. An S at the end indicates a 2½" disc.

IDEARCIN (Archimedes Interface for Internal disc(s))	£60
IDEA3IN (A3000 Interface for Internal disc)	£75
ARCHIMEDES INTERNAL CRADLE KIT	£15
ARCHIMEDES A300 / A400 SERIES FAN KIT	£15
4-SLOT 4-LAYER BACKPLANE	£52
POWER CABLE FOR SECOND HARD DISC	£5
A5000 SECOND HARD DISC FITTING KIT	£15

IDEA80	£179	IDEA240	£350
IDEA100	£215	IDEA330	£470
IDEA120	£245	IDEA426	£499
IDEA170	£275	IDEA540	£750
IDEA40S	£140	IDEA120S	£299
IDEA60S	£200	IDEA130S	£399
IDEA80S	£245	IDEA209S	£449

WIZZO IDE Filing System on rom

Package includes rom, manual and fitting instructions. Compatible with RISC OS 3.0 and 3.1. Allows up to four logical partitions over two physical drives. Each partition appears separately on the icon bar and can have different password protection. Makes use of existing Acorn hardware for maximum compatibility, but works with a wider range of hard discs. Security breaches using ADFS can be prevented. Can be fitted easily by a competent user.

Available now: WIZZO5 for A5000 — *introductory price* £29
Available soon: WIZZO4 for A4 — *introductory price* £29

Quantity discounts available • Dealer enquiries welcome

ICS (Ian Copestake Limited) Dept B45, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

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JULY 1993

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smArt *4mation* £50
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*Please specify English, French, German, Spanish or Welsh – each *4mation* £15
smArtFiler *4mation* £32
smArt Modern Languages *4mation* £19
Smudge the Spaniel, age 4-8 *Storm* £20
Snippet (new version) *4mation* £32
Soapbox *Xavier* £34
SolidCAD *Silicon* £79
SolidsRender *Silicon* £79
SolidTools *Silicon* £234
SongBook, age 3-10 *EMR* £24
Sound Engineer, age 12+ *EMR* £59
Sound FX Maker *CIS* £31
Sounds & Rhymes *Xavier* £29
Spark *David Pilling* £5
SparkFS *David Pilling* £20
Sparkle *Morley* £59
Special *ICS* £10
– site licence £30
Speech! *Superior* **£17**
Spelling week-by-week *Chalksoft* £21
Spex *ExpLAN* £98
Spheres of Chaos *Matt Black* £19
Splash, age 7-11 *Sherston* £19

Splice *Ace* £29
Split an Image, age 7-16 *Sherston* £16
Spoken Word *Wyddfa* £16
Spooler *Computer Tutorial* £9
Sporting Triangles *CDS* £19
SportsDay *Selective* £22
SportsPeople *Selective* £22
SpriteEd *Computer Tutorial* £17
SpySnatcher *Topologika* £12
Square Route *Computer Eyes* £16
Starspell Plus *Fisher-Marriott* £19
StartWrite *Icon* £55
StockPack *Topologika* £37
StoryBook, age 3-10 *EMR* £59
StrongED *Stallion* £22
Studio24Plus Version 2, age 11+ *EMR* £149
Studio24Plus Version 3, age 12+ *EMR* £210
SUMthing *Resource* £19
SuperDump *Silicon* £20
Superior Golf *Superior* £14
SuperPlot *Silicon* £20
Supersounds *CIS* £15
Supersounds 2 *CIS* £15
Swiv *Krisalis* £19

TABS *ExpLAN* £95
Talisman *Minerva* £8
Talking Pendown *Longman* £58
Talking Pictures *Wyddfa* £16
Target Maths *Triple R* £15
Technodream (Nevryon 2) *Superior* £20
TechWriter *Icon* £159
Thinklink *Xavier* £29
ThinkSheet *Fisher-Marriott* £38
Thundermonk *Minerva* £11
Tiles *Brain Games* £16
Timeshare *Fisher-Marriott* £19
Timetabler *Minerva* £549
Time Traveller, KS2 *ESM* £37
– Britain Since the 1930s, KS2 £30
– Expansion, Trade and Industry, KS3 £36
– Making of the United Kingdom, KS3 £39
– Medieval Realms, KS3 £36
– The Victorians, KS2 £30
TinyLogo/Draw *Topologika* £34
TinyPuzzle *Topologika* £24
Titler *Clares* £119
Toolkit Plus *Clares* £36
Tools Graphics, drawfiles *Micro Studio* £23
Topographer *Clares* £63
Touch Type *Iota* **£35**
Tower of Babel *Cygnus* £17
Trace *David Pilling* £5
Tracer *Midnight* £46
Tracker *Leading Edge* £37
Transport, drawfiles *Micro Studio* £25
Turbo Type *CIS* £20
Tween *Ace* £30
Twin *Acorn* £24
Twin World *UBI Soft* £14
TWO (Task and Window Organiser) *ICS* £10
– site licence £30
TypeStudio *RISC* £39

Utility Disc 1 *Data Store* £8
Utility Disc 2 *Data Store* £13
Utility Disc 3 *Data Store* £7
Utility Collection *Data Store* £21

Vector *4mation* £75
View»Mac 3 *Human* £65
– Arc/Mac Cable *Human* £24
Viewpoints, age 7-11 *Sherston* £37
Virtual Golf *Fourth Dim* £25
Visual Backup *Dabhand* £42
Vox Box *Clares* £46

Waterloo (not OS 3.1) *Turcan* £19
Whale Facts *Topologika* £34
WindowEd *Armen* £27
Word Bank *Topologika* £25
Words and Pictures *Chalksoft* £18
WordWorks *CC* £38
Wordz *Colton* £89
World Geography Maps, draw *Micro Studio* £23
WorldMaker, KS3,4 *ESM* £57
World Map Study, KS3,4 *ESM* £67
Worldscape *Leading Edge* £17
World Wildlife, sprites *Micro Studio* £16
Worra Battle *Oak* £15
WorraCAD *Oak* £79

Yacht 2 *Computer Tutorial* £49
Yacht 7 *Computer Tutorial* £94

Zarch *Superior* £14
Zelanites (not OS 3) *Micro Power* £15
Zool *Gremlin* £20

I²C PRODUCTS . . .

AnDi Oddule *Baildon* £39
I²C Adaptor (needed unless you already have an I²C socket) *Baildon* £10
I²C SWI (enhanced IIC_Control) *Baildon* £15
– bought with Oddule £5

ICS

051-625 1006

HARDWARE

SCANNERS, DIGITISERS . . .

ArcScanner including Epson GT-4000 *Clares* £1660
Colour Converter *Lindis* £145
FaxScan *Spacetech* £94
GreyHawk *Wild Vision* £98
Handipad *TechSoft* £173
Hawk V9 MkII *Wild Vision*
– standard £199
– hardware dithered £259
HiVision Digitiser Colour *HCCS*
– A3000 External £137
– A3000 Series / A4000 Internal £124
– A5000 / 300 / 400 £124
iImage (Sharp JX-100) *Irlam*
– for A5000 £490
– for other computers £589
Image Scanner *Iota* £383
– Colour Upgrade Kit *Iota* £239
– Fast Parallel Card *Iota* £98
i-Scan 200 *Irlam* £539
i-Scan 400 *Irlam* £589
Pineapple Colour Video Digitiser *Pineapple* £195
– A3000 boxed *Pineapple* £230
ProImage (Epson GT6000) *Irlam*
– for A5000 £989
– for other computers £1089
Scan-Light A4 *CC* £277
– with Sheet Feeder *CC* £360
Scan-Light 256 *CC* £190
– A3000 internal *CC* £190
Scan-Light Professional *CC* £565
– as above + SCSI interface *CC* £699
SnapShot Colour Video Digitiser *Lingenuity* £195
– A3000 version *Lingenuity* £275
Spectra *RISC*
– Archimedes / A5000 £545
– A3000 Series / A4000 Internal £545
– A3000 External £555
Vision Digitiser *HCCS*
– A5000 / 300 / 400 Mono £48
– A5000 / 300 / 400 Colour £76
– A3000 External Mono £60
– A3000 External Colour £89
– A3000 Series /A4000 Internal Mono £48
– A3000 Series / A4000 Internal Colour £76

MEMORY . . .

Fitting extra unless otherwise stated
† Fitting farily easy ‡ Fitting needs expertise

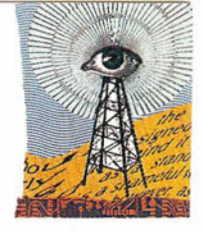
A3000 2 Mb Upgradable † *Atomwide/IFEL* £43
A3000 4 Mb † *Atomwide/IFEL* £110
A3010 1-2 Mb **£29**
A3020 / A4000 2-4 Mb † *IFEL* £55
A310 2 Mb Upgradable soldered ‡ *IFEL* £88
– as above + MEMC1a £113
– as above + MEMC1a + fitting £143
A310 4 Mb soldered + MEMC1a ‡ *IFEL* £152
– as above + fitting £182
A5000 2-4 Mb Non-upgradable † *Atomwide* £85
A5000 2-4 Mb Upgradable † *Atomwide* £99
A5000 2-8 Mb including fitting *Atomwide* £500
A5000 4-8 Mb including fitting *Atomwide* £391
A540 4 Mb † *Acorn* £238

PRINTERS . . .

ArcLaser 300-6 *Calligraph* £895
ArcServer 300-8 *Calligraph* £985
Bubble Jet BJ-10sx *Canon* £187
Bubble Jet BJ-10sx + TurboDriver *Canon/CC* £219
Bubble Jet BJ-200 *Canon* £282
Bubble Jet BJ-230 *Canon* £315
Bubble Jet BJ-300 *Canon* £325
Bubble Jet BJ-330 *Canon* £380
Bubble Jet BJC-800 + TurboDriver *Canon/CC* £1374
DeskJet 510 *Hewlett-Packard* £275
DeskJet 500C *Hewlett-Packard* £375

For ordering details please turn to page 3

0274 580 519 DAVE HITCHENS



ACORN DEMOS MULTIWORKS

ACORN has demonstrated its A5000-based MultiWorks multimedia workstation in public for the first time.

The demonstration showed how a CD-Rom can be created on a Unix workstation, using a writable CD (Worm) drive. The CD, which can contain JPEG motion video clips, is then completely compatible with PCs and the Acorn Multi-Works workstation.

A new JPEG real-time decompression board, designed for use with *Replay* and developed by Irlam Instruments, was used in the Acorn.

MultiWorks is an EC-funded project to exploit multimedia across a number of platforms. There are no immediate plans for Acorn to market a Multi-Works version of the A5000.



The Acorn MultiWorks station, based on the A5000

BEEBUG BUNDLE

NEW on the Beebug price list at £1829 + VAT is an enhanced Acorn A4 Portable with a 210Mb hard drive. This is to be a replacement for the standard 60Mb device.

Beebug has also relaunched its A3010 Home Professional System. This proved very popular when launched at the end of last year.

Beebug's sister company, Risc Developments, has announced a new range of IDE hard drives up to 450Mb in capacity, with 210Mb internal drive options for A3000/A4000 users.

For further information contact Risc Developments/Beebug on (0727) 840303.

NEXUS JUNIOR

A cut-down version of the Nexus networking system has been announced by SJ Research.

Nexus Junior provides a simple, server-based system which enables software for everyone on the network to be stored and accessible on one machine's hard disc.

Station access is limited to read-only but users can still save files locally to floppy disc as required.

All stations will also be able to share the printer attached to the server machine. SJ Research has designed the system to simplify the management of software in a classroom environment.

Any Archimedes with a minimum of 2Mb Ram can act as a server and Nexus Junior is compatible with either Risc OS 2 or 3.

An introductory price of £399 for a four-station pack is being offered by SJ and for an extra £200 the company will send an engineer to install the system for you.

SJ Research can be contacted on (0223) 416715.

ACORN SKIPS GENERATION TO 700

ACORN will base its next generation of machines on the Arm700 chip, skipping the Arm6 generation, according to Arm Ltd's managing director, Robin Saxby. Performance of the Arm700 is expected to be double the Arm6 family, with no 4Mb memory restrictions as with the Arm2 and Arm3.

The improved performance is down to a larger on-chip instruction cache than the Arm600, improved architecture optimisations and much more sophisticated memory management system. Arm700s will be produced on 0.8 micron silicon which means they will not be larger than an Arm600 despite having more transistors. The Arm chip's current frugality will be maintained.

Also expected to be featured by Acorn are Arm Ltd's new Vidc20 chip, which will provide 24-bit graphics, and the FPA10 floating point accelerator. The Arm700, scheduled to appear before the end of the year, is a logical development of the Arm600, itself a development of the Arm3 currently used by Acorn.



The A540 is currently the top of the range Acorn machine, but not for long

● Despite hints, a firm release date for the long-awaited FPA10 has not been announced. However, a technical paper on the chip has been released by Arm Ltd. The 134,000 transistor chip, Arm's most complex IC to date, is designed to work at around 4MFlops. A subset of Arm's floating point instruction set is handled on-chip, with less-frequently used instructions remaining as part of a software emulation. The IEEE 754 standard is supported.

Arm Ltd says there is a performance comparison between the FPA10 and the rival MIPS R3010 floating point co-processor, though the latter will consume several times more power.

If you use Cad or ray-tracing the FPA10 appears to promise much. Arm Ltd is on (0223) 813000.

Robin Saxby is this month's Moxon Interview on page 120.



051-625 1006

DeskJet 550C	*Hewlett-Packard*	£475
Laser Direct HiRes4	*CC*	£899
– 250-sheet Paper Cassette		£99
Laser Direct HiRes8	*CC*	£1275
Laser Direct HiRes Board	*CC*	£325
Refill toner cartridge for Canon EPS		£50
New toner cartridge for Canon LBP-4		£59

COMPUTERS . . .

A3010 1MB FD Family Solution	*Acorn*	£420
A3010 2MB FD Learning Curve with Monitor	*Acorn*	£675
– as above + JP150 Printer		£889
A3020 2MB FD	*Acorn*	£749
A3020 2MB HD60	*Acorn*	£899
A4 2MB FD	*Acorn*	£1395
A4 4MB HD60	*Acorn*	£1695
A4 4MB HD80	*Acorn*	£1699
A4 4MB HD120	*Acorn*	£1799
A4 Extra Battery Pack	*Acorn*	£50
A4 Shoulder Bag	*Acorn*	£35
A4000 2MB HD80	*Acorn*	£945
– as above + Home Office		£995
A5000 2MB HD80 Multiscan	*Acorn*	£1395
– as above + Learning Curve		£1455
Pocket Book	*Acorn*	£212

MISCELLANEOUS. . .

386 PC Expansion Card 25 MHz	*Aleph One*	
– 1 Mb		£374
– 4 Mb		£468
486 PC Expansion Card	*Aleph One*	
– 1 Mb		£463
– 4 Mb		£557
4-slot 4-layer Backplane	*IFEL*	£52
9060S Monitor	*Eizo*	£450
A300/400 Fan kit	*ICS*	£15
A3000 Expansion Box	*Wild Vision*	£135
A310 RISC OS Carrier Board ‡	*IFEL*	£18
A5000 Fitting Kit for second hard disc	*ICS*	£15
Arckey Function KeyStrip Holder	*ICS*	V0 £3
– pack of 4		V0 £10
ArcNET	*ACS*	£69
ARM3 ‡	*Aleph One/IFEL*	£165
ColourBurst	*State*	£322
ColourCard	*CC*	£225
– A3000 External	*CC*	£225
Dongle Dangle with screw fittings	*ICS*	£6
Fan filters (pack of 10) (not A5000)	*ICS*	£6
FaxPack	*CC*	£289
Floppy Discs, 10 × 3½" High Density		£10
G16	*State*	£258
G8 Plus	*State*	£238
G8 Plus Video Switch	*State*	£23
HiPoint Mouse for A4	*Genius*	£49
Microlin fx Pocket Fax Modem	*Pace*	£179
Micro Mouse	*Clares*	£26
Monitor Stand for A3000	*ICS*	£21
Mono/SCSI	*Atomwide*	£48
Podule Case for A3000	*HCCS*	£16
Printer/SCSI	*Atomwide*	£74
Print Port Sound Sampler	*Leading Edge*	£42
Publishing Pack	*CC*	£475
RISC OS 3 Upgrade	*Acorn*	£42
– Bulk package	*Acorn*	£335
– A5000	*Acorn*	£19
Seal 'n Type spill-proof Keyboard Covers		
– Archimedes / A5000	*Kador*	£14
– A3000	*Kador*	£14
TouchWindow	*Lindis*	£234
Whisper Fan Quietener (for A300/A400 series only)	*ICS*	£15
Wizzo IDE Filing System on rom	*ICS*	
– **Wizzo4** for A4		**£29**
– **Wizzo5** for A5000		**£29**

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QuicKey

"Congratulations on ColourSep! The results, compared with the drivers currently available, are bordering on the fantastic."
NOW ONLY £15

PLACARD

Whisper

TWO

"TWO is the best thing I've ever bought."
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ColourSep

fontasy

"Spécial"

DrawBender

PADLOCK

As well as letting you type all those extra characters, Special is the easiest way to examine new fonts.

"DrawBender is quite stunning."
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Padlock is our top seller for simple disc security.

"Fontasy offers a wider range of effects than FontFX. It is a package for the perfectionist, whether professional or enthusiast."
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HOW TO ORDER

VAT: Zero-rated items are marked V0. UK customers please add 17.5% to all other prices. EC customers outside the UK (including BFPO) please do the same unless you are VAT registered, in which case quote your international VAT number. Ours is GB 595 7258 84.

CARRIAGE IS FREE WITHIN MAINLAND UK IF YOU PAY ON ORDERING.

Overseas carriage: If you are paying by credit card we will add airmail and insurance at cost. Otherwise please add £6 (Europe) or at least £12 (elsewhere) for each software item and send a pounds sterling bank draft payable at a London clearing bank, or Eurocheques for not more than £100 each.

Credit cards are welcome. We do not charge your account until your order is fulfilled. Your name and address must be as known to the credit card company. If you are leaving an order on our answering machine please include your telephone number, the expiry date of your card, and your calculation of the total payment due. We will make no charge for credit card commission unless we have informed you first.

Official orders are welcome from UK government and educational institutions. Payment is due in 14 days. Invoices are subject to carriage and late payment charges.

Site licences are available for most products. Please check our prices.

All products, prices and specifications are offered in good faith and are subject to change without notice. We process all orders immediately, but suppliers do sometimes keep us waiting. Goods are guaranteed but we do not supply them on approval. Returns and cancellations can only be accepted by prior agreement and there may be a charge to cover the costs involved.

AUTHORISED ACORN DEALER

ICS (Ian Copestake Limited)

Dept B45, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

Tel: 051-625 1006 Fax: 051-625 1007

E&OE D61 93JE18

LICENSED CREDIT BROKER

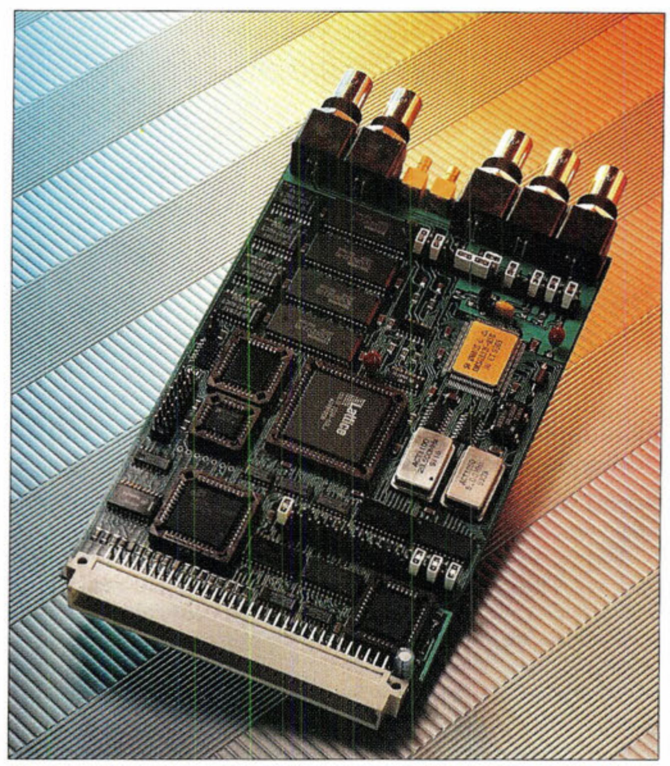
STATE MACHINE SENDS CARDS

STATE Machine is celebrating its first birthday with the release of two new video cards based on the original G8 graphics accelerator range.

The G16 graphics accelerator has all features of the G8 Plus, with 16 bits per pixel *ArtWorks*-compatible modes, *Replay*-compatible modes offering up to 32,768 colours at 25 frames per second, and 65535-colour modes for your own applications.

ColourBurst has the features of the G16 but a megabyte of memory instead of 512K. State Machine uses memory-mapping techniques to overcome the Arc video chip memory addressing limit of 512K.

So far, you can preview static desktop 256-colour screens in 1152 x 848 pixels and *ArtWorks* drawings in 32,768 colours at 800 x 600 pixels. Work is underway to enable Risc OS to operate in these new large screen modes.



State Machine's birthday card

You can connect ColourBurst output direct to CCIR Pal devices like video recorders and TVs, and S-Video is supported too.

An optional extra is genlocking to mix ColourBurst output with live video. State Machine has implemented the latest in reprogrammable gate arrays from Lattice. Unlike similar Xilinx chips used by Computer Concepts and Wild Vision, the Lattice chip is based on flash technology which means it is non-volatile.

Expansion space is provided on the card for future add-ins like a simple sync gen-lock facility, an RGB bandwidth limiter, a composite Pal and S-Video encoder, and an internal RGB video switch for the A540 and A5000.

The G16 costs £279 + VAT and ColourBurst £399 + VAT.

State Machine can be contacted at: Unit 4, Stopsley Business Centre, St.Thomas's Road, Stopsley, LU2 7UX. Tel: (0582) 485151.

ACORN WORLD '93

A picture is emerging of what we can expect from the Acorn World '93 show in October.

The show theme will be 'Vision for the Future' and to reflect this there will be dedicated feature areas for publishing, professional services and home business. A special education centre will show initiatives for the National Curriculum and special needs.

Another highlight of the show will be Acorn's restated move to attract more home users. A games arcade section will be complemented by a laser light show, while on a more serious note, seminars will cover issues from business and technical to leisure topics.

Show director, Kevin Coleman, commented: 'Acorn World will be the premier Acorn exhibition of 1993, presenting a totally new concept in computer shows. We believe it will demonstrate what can be achieved by a major manufacturer working closely with its partners and will set new standards for innovation.'

Acorn World is at Wembley Exhibition Centre between October 29-31 and is organised by Acorn Computers and sponsored by *Acorn User*.

SILICON VISION UP TO SOME MONEY BUSINESS

SILICON Vision has released two interesting new business applications: *ProSHEET* and *Payroll Manager*.

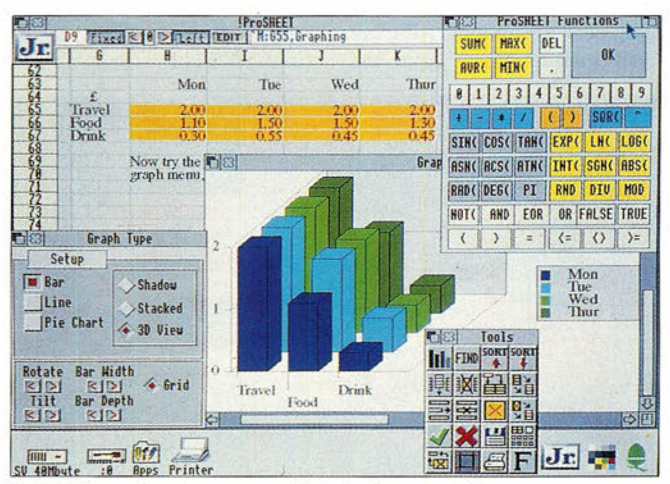
ProSHEET is notable because at £39.95 + VAT it substantially undercuts the Risc OS spreadsheet competition. Features of the package include hot-linked graph plotting with 3D options, macros, icon-driven toolbox menus, spreadsheet contents reporting, a calculator pad for numeric entry, variable column widths and the ability to run comfortably on a 1Mb machine.

Silicon Vision says that it paid particular attention to the user interface with ease of use being the prime consideration. A novel *ProSHEET* feature is the user-definable menu cell which users can use to create custom menus and thereby control various spreadsheet operations.

Payroll Manager has been in trial use for two years already and, according to Silicon Vision, was also designed with ease of use in mind.

The package is fully Risc OS-compliant and can manage weekly or monthly salaries, holiday pay, total employer expenses, wage slip printing, cash breakdowns, and tax year issues like P14/P60 information. Record locking is featured for security reasons, to prevent unauthorised users dipping into confidential information on the system.

Other facilities of the package include employee record searching and implementation



ProSHEET: work out your expenditure for less expenditure

of all the Budget tax changes for the tax year 1983/84.

Future updates on any changes can be guaranteed via a 25 per cent annual registration fee. Payroll Manager is priced £99.95 + VAT.

For more information Silicon Vision can be contacted on 081-422 3556.

EUREKA! LONGMAN UPGRADES

LONGMAN Logotron has announced an improved version of the *Eureka* spreadsheet package.

Over 100 enhancements are listed, including a series of spreadsheet publishing improvements, a window zooming option, formula printing, improved worksheet linking, partial sheet exporting, better memory management, additional macro features. And there is a lot more.

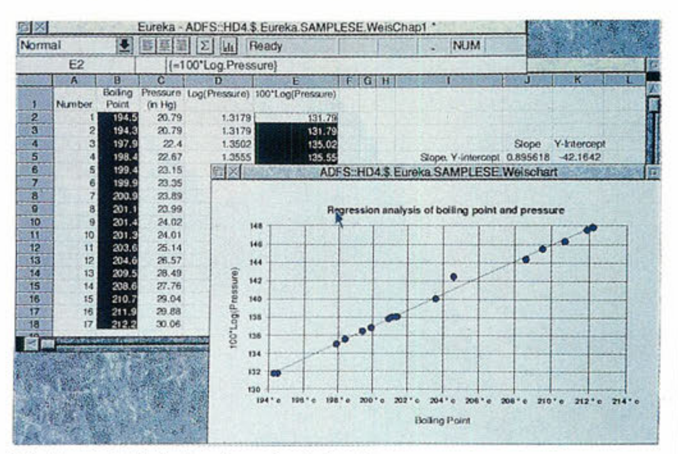
Longman Logotron has kept the price of *Eureka 2* at £119 + VAT though all registered users of previous *Eureka* releases are entitled to a free upgrade.

There is also a special trade-in price of £82.10 + VAT to users of rival Risc OS spreadsheets. This offer is scheduled to run up until 17 September of this year.

● In addition, Longman Logotron has started to ship the talking version of its *PenDown* word processor for schools.

This text-to-speech system can say what you write, or it can read out previously-marked words or paragraphs. Research has indicated that some pupils can benefit to a marked degree from computers which speak. *Talking PenDown* is priced at £64. In addition, site licence options and discounts are available for existing, registered users of the *PenDown* package.

For more details, contact Longman Logotron on (0223) 425558.



Printing and displaying formulae in Eureka

STAR PERFORMANCE

STAR Micronics has announced the latest incarnation of its popular LC24 dot-matrix printer series.

The LC24-20 II is an updated version of the current LC24-20, featuring a bigger 39K buffer which can be expanded to 71K.

Star says that the larger buffer size, combined with the Compressed Data Mode, optimises the LC24-20 II for graphical operation, reducing data transfer times from the computer to the printer by around 25 per cent.

As dot-matrix printers go, the Star has a pretty advanced specification, but, at a recommended £299 + VAT, it is up against some stiff competition from the latest ink-jet printers produced by Hewlett-Packard and Canon.

Star has also announced price reductions on its LC-100 nine-pin and LC24-200 24-pin colour printers. Star is on (0494) 471111.



The reduced LC-100 and LC24-20

GERMAN SHOW

ARCHICUM is Germany's first Acorn-specific computer show. The event takes place on 18-19 September at Illertissen.

The exhibition hall has a stand area of 450m^2 and UK exhibitors are welcome.

The organiser is Schneider Scholz GbR, Reichenberger Straße 8, 89257 Illertissen, Germany. You can contact the organisers on 01049-7303 6150 or fax on 01049 7303 2332.

ACORN JOB MOVE

JO Magnani, who has 12 years networking experience at Honeywell Bull and Olivetti, is Acorn's new product manager for networking.

Her main task will be to ensure schools have the best possible support on networking issues. Acorn has launched a network management pack for schools running AUN Econet or Ethernet-based networks. Acorn is on (0223) 254254.

OAK SOLUTIONS ROUND-UP

● **WORRACAD** has been given a facelift by Oak Solutions. The draughting package, capable of producing drawings larger than A0, gains a new icon-based user interface and is fully Risc OS-compliant. Drawings can be exported as *Draw* files and Risc OS printer drivers are supported, though a dedicated HPGL driver is retained for use with plotters, cutters and engravers. *WorraCAD* is £99.95 + VAT, with a £30 discount to education customers. Registered users can upgrade for £30 + VAT.

● **MKII** of the Oak Recorder sound sampler is now available. Like its predecessor it plugs into the printer port but features a higher-quality microphone, a more flexible input socket for other audio sources from CD players to electric guitars, and *SoundLab* sample editing software as standard. The all-in price is £39.95, with £5 off for education. *Soundlab* on its own is £19.95 (£5 off for education).

● **OAK** is offering all-in-one ClassNet/ClassRom cards. The cards provide ClassRom hard disc security and management for internal drives in networked Archimedes as well as an ethernet interface.

ClassRom, designed specifically for classrooms, uses drive partitioning to enable applications to be run on a computer but not altered or deleted by pupils. Teachers have password access.

Network File management abilities to make life easier for network managers include automatic updating of all ClassRom hard drives in a ClassNet network.

● **AFTER** the recent merger with Ace Computing in Cambridge, Oak Solutions has decided to move its sales office to Cambridge.

All sales enquiries should now be addressed to: Oak Solutions Ltd, Broadway House, 149-151 St Neots Road, Hardwick, Cambs, CB3 7QJ. Tel: (0954) 211760 or Fax (0954) 211767.

COMING TO A SCREEN NEAR YOU

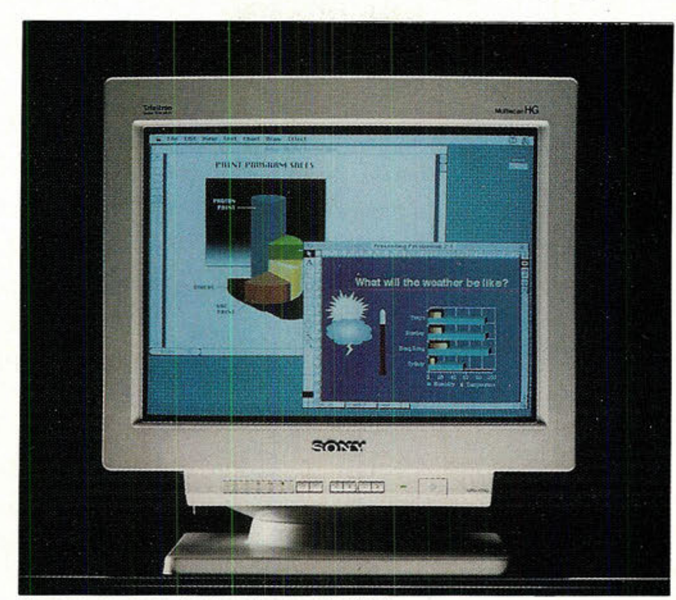
BOTH Sony and Taxan have new big-screen high resolution multisync monitors to keep a lookout for.

The latest Multivision high-resolution colour monitor from Taxan is the 17in 875plus LR. 17in monitors offer a 56 per cent increase in display area over the more usual 14in.

The horizontal scanning frequencies supported range between 30 and 78KHz and displays of up to 1280 x 1024 pixels can be handled at 72Hz refresh. If you can put up with more flicker, 1600 x 1200 pixels can be displayed using a 60Hz refresh rate.

Taxan says that the 875plus conforms to the toughest MPR2 low radiation emission regulations. The 875plus is £1049 + VAT. Taxan can be contacted on (0344) 484646.

Sony's new CPD-1730 is another entry into the expanding 17in monitor market and can support non-interlaced modes up to 1024 x 768 pixels resolution. Push-button controls are available to adjust picture settings like brightness/contrast, picture distortion and positioning and up to nine presets for different screen modes can be stored.



Keep an eye open for Sony's new CPD-1730

Dynamic focusing is used to ensure focus is maintained into the corners of the screen and there is even a feature to combat distortion from the Earth's magnetic field.

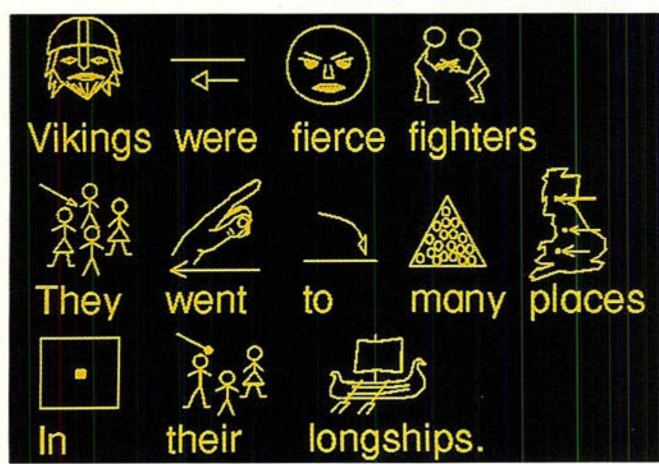
The CPD-1730 is also MPR2-compliant. Recommended price is £1195 + VAT. Sony is on (0784) 466660.

WIDGIT SYMBOLS

WIDGIT Software in Leamington Spa has launched its *Symbol Collection* library of around 1000 scalable *Draw*-compatible symbol characters mainly comprising most of the Rebus (representation of words by pictures) Glossary originally devised by Judy van Oosterom and Kathleen Devereaux. The symbols are used as pre-reading aids for early learners and literacy aids for late adult learners.

Widgit has also launched *Viking Library*, a resource pack which contains over 250 annotated symbols aimed to help children learn all about the Vikings.

Both the *Symbol Collection* and *Viking Library* are compatible with Widgit's language, communication and literacy package, *From Pictures to Words*. For more information, Widgit can be contacted on (0926) 885303.



A strong combination of words and pictures in Viking Library

CHRISTIAN CLIP ART

A COMPREHENSIVE library of clip art aimed at anyone involved in Christian publicity has been ported from the PC and is now available from Swindon-based Reverend Ian Gooding. The bulk of the library, which numbers over 30 discs, is in sprite format, but some have been converted to *Draw* and *ArtWorks* format.



Archimedes customers get a good deal as though the single disc price is £7.99, the same as for Amstrad PCW and PC customers, there is more on each Arc disc.

Contact Ian Gooding at 18 Larksfield, Covingham, Swindon, SN3 5AD or on (0793) 520139.

In brief

● Micro Laser Designs and The Serial Port have both recently opened new premises in the West Country to serve Acorn customers. The Micro Laser Designs shop, which will specialise in imagesetting and publishing products, is at The High Street, Paulton, Bristol, BS18 5QE, Tel: (0761) 410711. You can find The Serial Port's new shop at 15 Union Street in Wells, Somerset. The Serial Port is on (0749) 670058.

● Minerva Training, part of Minerva Software, is now offering training courses for Computer Concepts' ArtWorks at its Exeter training centre. The one-day courses, which include lunch and course reference materials, cost £110 + VAT and sessions are restricted to four attendees. Accommodation can be arranged at extra cost if required. For more information contact Minerva on (0392) 426160.

● Greenware Limited has introduced a noise reduction system which can be fitted to Archimedes computers with cooling fans. The Noise Killer senses the temperature inside the computer case and regulates fan speed accordingly. The slower the fan the quieter your Archimedes. Greenware Limited is on (0273) 483890.

● Psion Series 3 specialist, Widget Software, has launched a metal desk stand for the popular pocket computer. The stand, which will work equally well with an Acorn PocketBook, is made from black anodised aluminium and is ergonomically designed. The price is £16.99 including VAT and Widget can be contacted on (0438) 815444.

● Last month we said that Morley Electronics' new 16-bit User Port/Midi/Analogue interface card does not actually feature Midi. In fact Midi is an optional extra costing £35 + VAT. Morley Electronics is on 091-257 6355.

● HCCS has produced a combined user port/analogue interface card for full size Archimedes models like the A5000, A300/400 series and the A540. The card is priced at £39 + VAT and is intended to complement HCCS' existing Wise range of cards for the A3000/4000 Archimedes family.

HCCS can be contacted on 091-487 0760.

The RISC Disc



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5. **Rogues Gallery** - a gallery of 44 Archimedes virus strains for rapid identification. Click for info on each strain.
6. **CatAflop** - copies images of your floppies onto hard disc in a few K for instant recognition.
7. **ImageFx** examples of imaging effects such as embossing
8. **Handy Hints** - a dozen topical Archimedes hints
9. **Hot Art** - hot keys for ArtWorks - a must for all ArtWorks users
10. **PollMask Manager** - Desktop programming utility for setting poll masks
11. **Shutdown Warning** - provides a customisable warning message when you close down the Desktop



The RISC Disc, which comes with a Desktop menu system providing information on each item, plus full supporting documentation, costs just £5.95 + VAT inc p&p. Order now **Code RD01** from:

RISC Developments Ltd, 117 Hatfield Rd, St. Albans, Herts AL1 4JS. Tel. 0727 840303, Fax 0727 860263

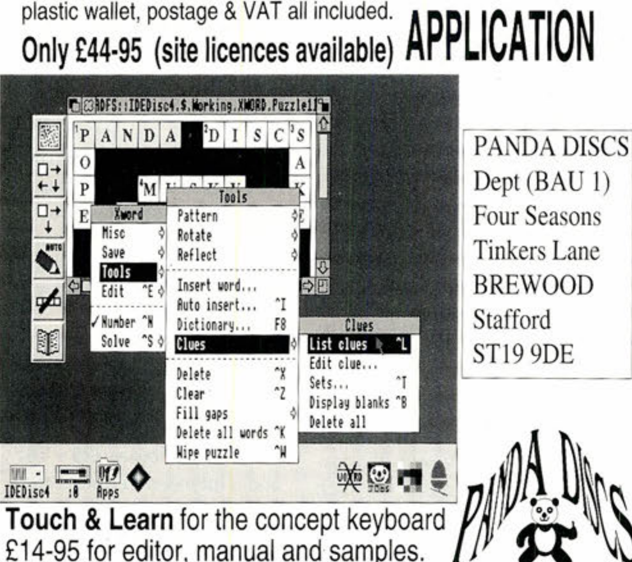
RISC Disc programs are not public domain and come with full technical support and 14 days money back guarantee.

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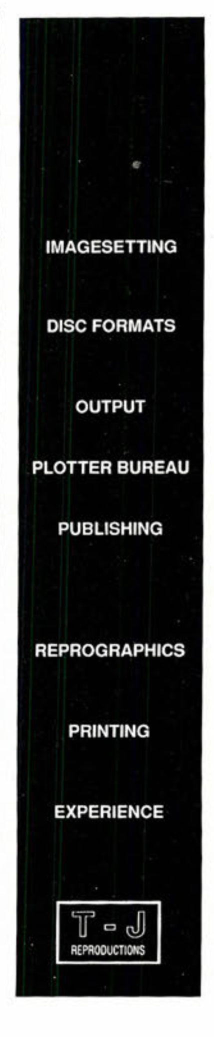
Touch & Learn for the concept keyboard
£14-95 for editor, manual and samples.

Demo disc of all Panda products + the infamous rather silly **!Panda** adventure game for £1-50 (HD extras for £2 inc.)

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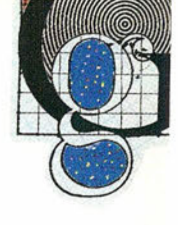
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CHANGING FACE OF THE ARC

ONE of the big buzz words in computer graphics these days is morphing. If you've seen the video for Michael Jackson's song 'Black and White', or more recently, the advert for Castrol Oil, you'll have seen morphing in action. And we at *Acorn User* are not the only people providing morphing software (for more details, see pages 36 and 76).

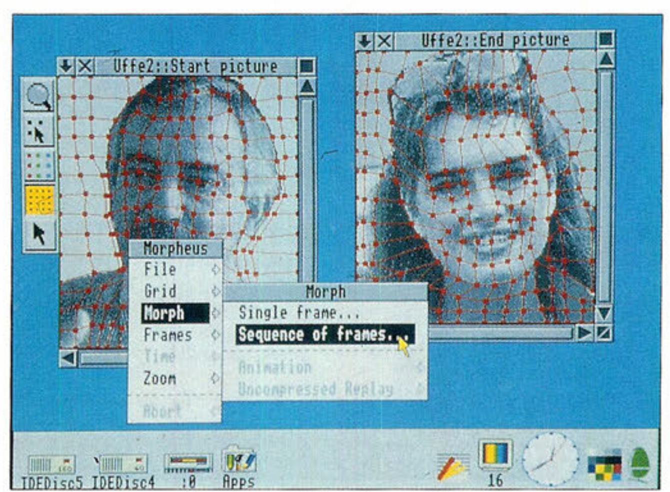
A new morphing package, *Morpheus*, has been coded by Henrik Bjerregaard Pedersen, who was also responsible for the *Process* image processing package featured last month.

Morpheus consists of a single Risc OS application that allows you to take two pictures and interpolate or 'morph' between them. The actual process of morphing involves the computer dividing the two pictures up into sections and then squashing and fading each section so that it turns into a corresponding section in the second picture.

You obviously need to tell the computer which parts of the picture have to be changed. In order to do this, a grid is placed over each picture and the points (or knots) on the grid moved so that the grid lines fall along contrasting areas on each picture.

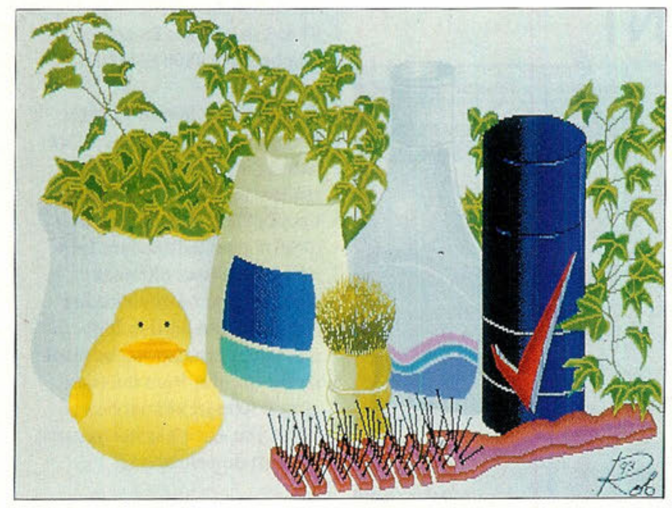
The amount of work required to produce each frame is considerable, but if you're willing to wait, quite exceptional results can be achieved and there is even the provision for 24-bit clear files to be used for the start and end pictures. Playback of animations is possible, and in addition you can get *Morpheus* to produce *Replay* files. This second option also allows you to view files consisting of 24-bit colour frames.

The release version of *Morpheus* is expected to be ready around the middle of July. It will retail at £30 + VAT and can be obtained direct from the author at Stengaards Alle 13 B, DK-2800 Lyngby, Denmark. Tel: 010 (+45) 42 88 37 56.



Morpheus uses a grid system to define the morphing process

PIC OF THE MONTH



THIS MONTH'S winner is the work of Rob Thompson form Lincoln and forms part of his A-level coursework folder. 'Still life' makes use of *Atelier*'s extensive selection of graded fills and the fact that the picture is in Mode 15 is hardly noticeable. £10 goes to Rob for his work.

If you have produced any pictures that you think are good enough, please send them in right away. Always state how you created them (what packages you used etc), and the machine you used. It needn't just be 32-bit computers; art work produced on Beebs is just as welcome.

ADD TO ARTWORKS

Computer Concepts designed the *Artworks* design package with future expansion in mind. A special programmer's reference manual is therefore currently in production which explains how to write *Artworks* modules. The manual contains a great deal of technical information and even includes much of the source code for the existing *Artworks* modules.

The developer's pack costs £10 + VAT and is available from Computer Concepts.

Whilst on the subject of *Artworks*, Computer Concepts has released another programmer's reference manual, this time explaining how to implement rendering of *Artworks* objects in third-party applications. Further details from CC. Tel: (0442) 63933.

In brief

● Matt Black, purveyor of 'innovative products' for the Archimedes, has just released the second in its series of *Vanguard Graphics* packs. *Cowboys & Indians* is billed as a 'comic book construction kit' and provides everything you need to create your own cartoon strips.

A whole selection of cowboy and indian characters are provided in a number of different poses. A selection of speech bubbles allows the user to add words to a story and a special 'Comic Book' outline font is included to give strips that authentic look.

The *Cowboys and Indians* pack costs £17 inc. VAT. A booklet provides plenty of hints and tips on how to create your own comic books.

Further details on this and Mat Black's large range of clip art can be obtained from Matt Black, PO Box 42, Peterborough, Cambridgeshire, PE1 2TZ. Tel: (0733) 315439.

● The list of Computer Concepts' *Turbo Drivers* increases this month with the release of Risc OS 3 Drivers for the Epson Stylus 800 inkjet printer.

The speed of the new Turbo Driver is claimed to be up to five times faster than other available drivers, and it's also the only driver to allow control over half-tone screens.

The Epson Stylus 800 Turbo Driver costs £57.57 inc. VAT and comes complete with a manual and the special printer cable used by the Turbo Drivers.

Risc OS 3.1 is required and at least 2Mb of Ram is recommended. Further details from Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX. Tel: (0442) 63933.

● You can contact the Graphics Page with any news, views, comments or pictures for the page by writing to Rob Miller, The Graphics Page, BBC Acorn User, 101 Bayham Street, London NW1 0AG, or by modem via Arcade BBS user #1144. Arcade is on 081-654 2212 or 081-655 4412. If you are using Arcade, please keep it to just messages. Any large files such as pictures should be sent on disc to the *BBC Acorn User* address above.



DOWNLOADING THE WORLD

THE Internet is a massive worldwide network of networks, linking companies, colleges, universities, schools, research, military and government sites of all countries. It is not owned or run by any one organisation, and use of the network for communication itself costs nothing.

Networks of computers communicate across the Internet using a set of hardware-independent protocols called TCP/IP, which allow multiple simultaneous operations to take place, such as sending and receiving e-mail, collecting network news groups (Usenet), and file transfers.

On the Internet in the UK, archive sites such as the Higher Education National Software Archive (HENSA) at Lancaster University are accessible for file transfers. Using TCP/IP, amazingly it costs no more to download a file from a file server in New Zealand than from Newcastle.

Access to the Internet is provided by various organisations, and it's here that charges are levied by the gateway or direct service providers. The Demon Internet Service has just celebrated its first anniversary, and the original target of 200 subscribers has expanded to around 1200 one year on. Demon has flourished as the Internet expands at what seems like an ever increasing rate, with more and more subscribers joining the net.



The world downloaded from NASA

A Demon account offers low-cost dial-up access direct to the Internet, with your own Internet site ID and e-mail address, and read/write Usenet news feed. There are thousands of newsgroups to read and post to, from rock 'n' roll to tennis, including Acorn computer groups. You can 'Telnet' into a computer that may be on the other side of the world, as you were using a terminal directly, or use 'FTP' (File Transfer Protocol) to download files.

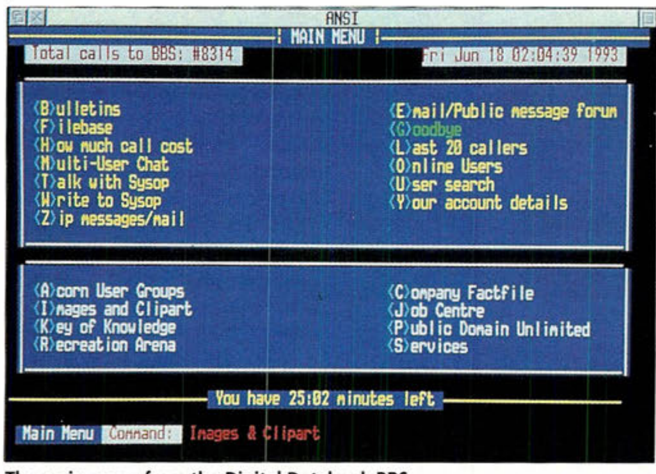
Demon Systems charge only £12.50 + VAT initial charge and £10 + VAT monthly. An Archimedes version of TCP/IP generically known as KA9Q can be downloaded from Demon, as well as from a number of bulletin boards. Call Demon Systems on 081-349 0063 for more information.

OPENING A BANK ACCOUNT

THE Digital Databank BBS located in Welwyn Garden City aims to bring together a mass of information about Acorn machines and related products into an easily accessible reference system.

SysOp John Stonier hopes it will promote a healthy interest in the Acorn industry and not only bring like-minded Acorn owners around the UK together but bring Acorn computers to the attention of non-Acorn owners.

A number of special-interest areas are featured, such as the Portable area for A4 and Psion/Acorn Pocket Book owners, Computer Clubs, Public Key cryptography, Sci-Fi and Amiga Users group. The Images and Clip Art section features all sorts of material.



The main menu from the Digital Databank BBS

The Digital Databank's Company Factfile section contains information about the activities and products of a number of companies in the Acorn marketplace.

The Digital Databank is FidoNet node 2:254/25. The numbers are 0707 329306 (300-16k8HST 8N1) 24hrs and 0707 323531 (300-2400bps 8N1 MNP 1-5) 1800-0600 hrs.

In brief

- A new scrolling bulletin board to call is Altered State BBS, run by Steve Smith in Hemel Hempstead. Online at the moment from 10pm – 6am, the BBS supports all speeds to V32bis (except 1200/75). While primarily an Archimedes BBS, Steve hopes to attract PC and Amiga users too with a lively, friendly and informative message base combined with quality file download content. Altered State BBS is on (0442) 233207 8N1.

- Motorola Codex claims its new 326XAFast-SDC modem can outstrip the basic ISDN digital line rate of 64Kbps, using VFast technology and synchronous data compression to achieve full duplex speeds up to 72kbps on analogue lines. The modem should be available this month but the price has yet to be announced. Contact Motorola Codex on 081-669 4343.

- Following BT's June half-price cheap rate local call offer, the cost of new residential phone line installations has been reduced by £40 to £99 + VAT from 1 June, and to £99 + VAT for additional lines from 1 September. You'll also notice the alphabet re-appearing on the keys of new phones – remember the old days of 'Whitehall 1212'? This is to enable BT to use US-style Freephone numbers like 0800 HELPLINE.

- In the US, Digicom Systems, backed by Hewlett Packard, are developing a future-proof modem technology using Ram based digital signal processing (DSP). Called SoftModem Technology, it allows different algorithms to be downloaded from a PC into on-chip DSP memory. Upgrades can be made by file transfer from the company's support BBS service. So when you want a faster modem, you just download one.

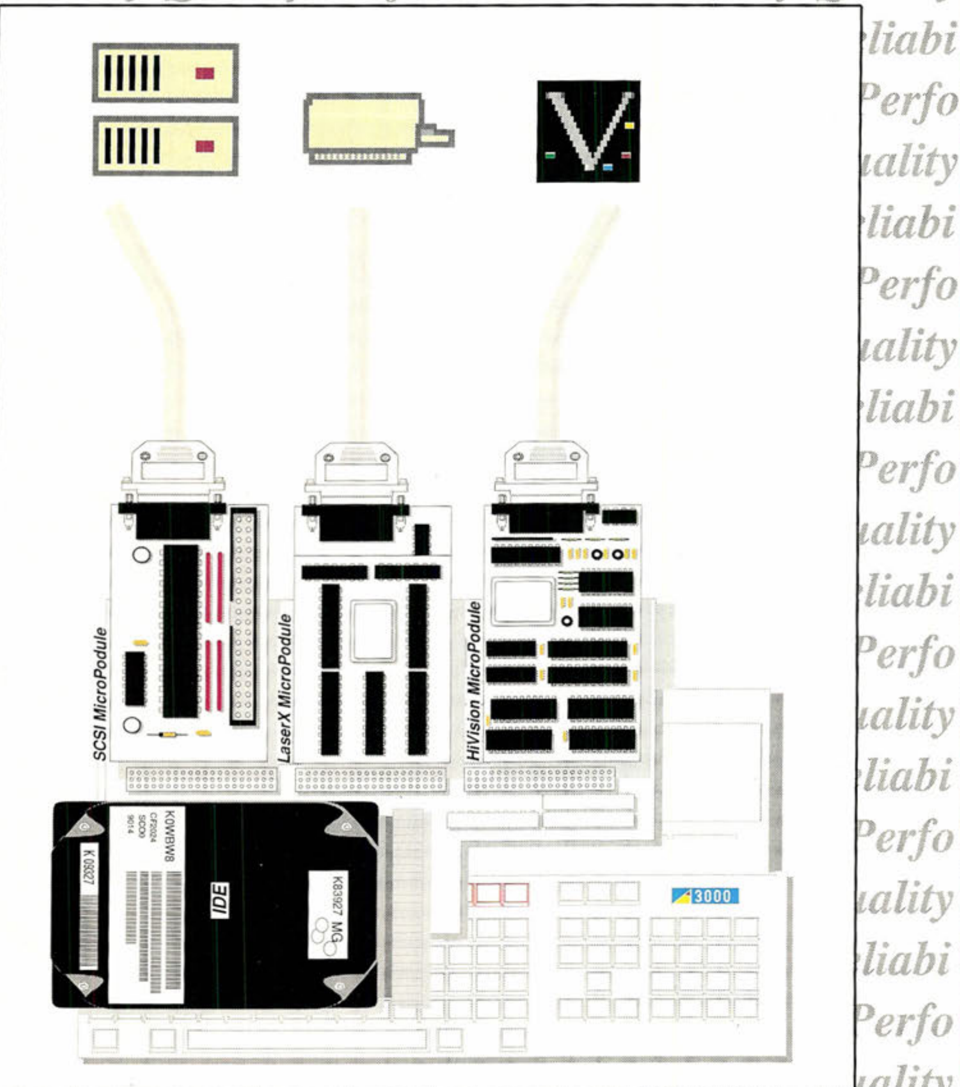
- You can contact me by writing to: David Dade, BBC Acorn User, 101 Bayham Street, London NW1 0AG or by e-mail to: DaviD@arcade.demon.co.uk or by modem on Arcade BBS, User #2 – 081-654 2212 or 081-655 4412.



Attention All Owners of an A3000 or A3010 With an Internal Hard Drive

A network of HCCS dealers has been appointed to professionally upgrade your computer to Ultimate using your existing hard drive. The old internal IDE hard drive, subject to suitability (most are), can be installed onto the Ultimate Expansion System, thus providing two (A3010) or three (A3000) free expansion slots. Contact HCCS for your nearest trade-up dealer.

Keep your affordable options open - trade-up to Ultimate!



Ultimate MultiPodules are available with 20Mb, 40Mb, 60Mb and 80Mb IDE Drives from the HCCS product range.

A3000	
Hard Disc Drives	
100Mb External	£479.00
200Mb External	£699.00
HardCard100	£429.00
20Mb IDE Internal with User Port	£179.00
60Mb IDE Internal with User Port	£269.00
Memory Upgrades	
1Mb RAM	£49.00
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Mono Vision External	£62.00
Colour Vision External	£92.00
Colour HiVision External	£142.00
Ultimate Expansion System	
MultiPodule (3 slot)	£38.00
MultiPodule+20Mb+PSU	£229.00
MultiPodule+60Mb+PSU	£309.00
A5000/400/300	
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Expansion	
Econet	£39.00
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A3010	
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Scanner (Hand)	TBA








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ZAP EDITING UP TO SCRATCH

SEVERAL commercial products have tried to replace *Edit* and add the features that should have been there from the start. As a public domain utility, *Zap* by Dominic Symes wins hands down.

The program allows a wide range of files to be edited, including text, Basic, machine code or raw data formats. Using *Zap* to edit text shows off the program well, with comprehensive search facilities and windows that scroll automatically when you want to select several pages of text. The option to output the result of a search to a separate window is very useful as is the undo option.

For the programmer, *Zap* allows Basic and machine code to be written in the desktop, where ease of editing is vital. Then you can drop it into Basic or run the listing directly with a simple hot-key press.



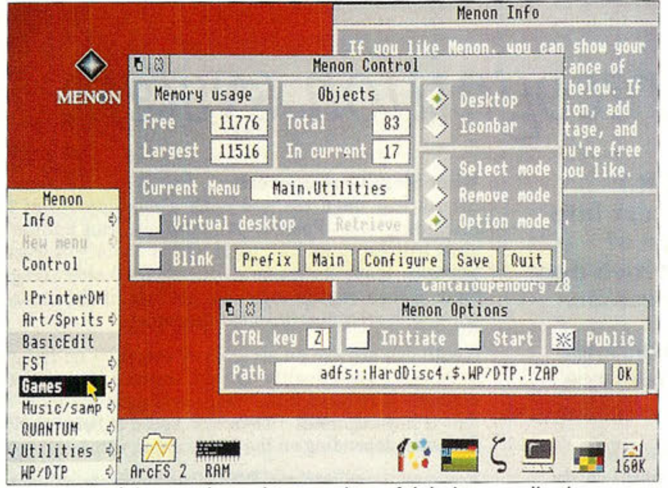
Editing files with a little extra Zap

Zap also makes it very easy to splice bits of code between windows: essential for programmers.

One or two bugs are still present, but Dominic is constantly updating the program, though, removing bugs and adding new features. A full C editing mode is planned so that all possible areas of editing can be covered.

An essential program for anyone who uses *Edit* and, considering it is PD, you can't go wrong.

MENON MOVES TO 2.06



VERSION 2 of the popular and extremely useful desktop application launcher is now available, and is well worth a look. One or two bugs have been removed, and a much neater menu system has been implemented.

FRESH ON THE MENU

AS a desktop utility, *Dirmenu* helps get the most out of Risc OS, allowing easy access to large directory trees.

It is effectively an extension of the open parent option found on filer menus. By clicking Menu on the title bar of a Filer window, a menu of all the previous directories will appear, allowing easy access back through the directory structure.

This is obviously only worthwhile if you have a hard disc, but if you use a comprehensive directory structure it is definitely worth adding this to your bootup sequence.

ARC EMPIRE LAUNCHES DISC MAG

NORWEGIAN group Arc Empire has joined the busy disc magazine scene.

Having liked the contents of *New Dawn* but not the displayer, Zynx aims to create an Arc scene, similar to the effect *Grapevine* had on the Amiga.

Apart from an excellent mini demo featuring a plasma-mapped vector polygon, the main magazine code was not up to the high standard usually associated with Arc Empire.

The text-scrolling was poor, but there are a number of interesting articles including a novel approach to speeding up your A3000.

A magazine produced by a big name demo group is bound to attract contributions, so issue two should be worth looking out for.

In brief

● Dave Holden of APDL is holding an international competition for the best PD and shareware software on the Archimedes. For more information, send an SAE to: APDL, 39 Knigton Park Road, Sydenham, London, SE26.

● The Lunchtime crew, authors of the popular disc magazine, have been completely rewriting the magazine program. This should make a debut very soon. Keep a lookout for a review soon.

● In addition to Arc Empire's new disc magazine, the Acorn Archimedes User Club publication is soon to be released. Formed in the usual disc magazine style, with news reviews and PD spread over two discs, *AAUC* will be up against tough opposition from the well-established *Illusions*. Further information can be obtained from : AAUC, 58a Branksome Drive, Nabwood, Shipley, West Yorkshire BD18 4BE.

● Newly-formed Bytepool Productions has excelled with its first code, the Nirvana megademo.This multi-part demo is presented well with good use of quality music and a nice, rippling disc during loading. The five main sections do not feature anything amazingly new for the Archimedes, but contain some nice sprite effects. The transparency section is very fast: and this is no easy thing to achieve on the Archimedes compared to the Amiga.

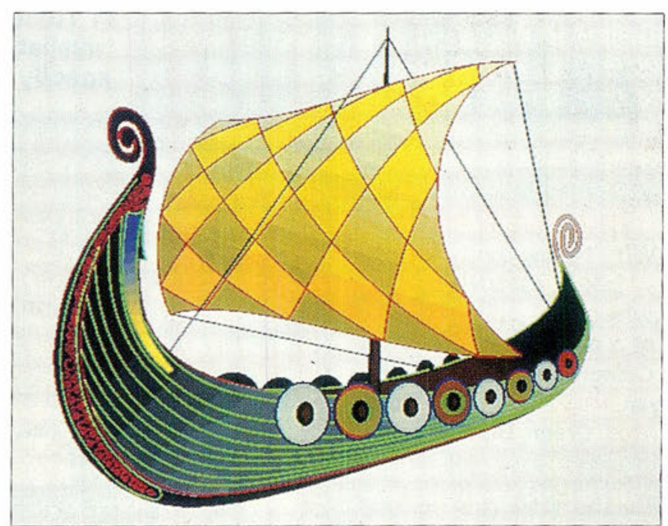
In anticipation of the next show in October, demo giant Armaxess is working on a brand-new multi-part megademo, which should be ready for the planned release at Wembley. From what I've seen so far, the demo should put Armaxess back to the top of the Arc demo scene, as well as adding some revolutionary effects only just being introduced on other machines like PCs.

● If you have anything interesting to say about PD or you just want to drop me a line, you can contact me, COBRA, at BBC Acorn User, 101 Bayham Street, London NW1 0AG. For addresses of PD libraries, see the Software Showcase at the end of the magazine. Share and enjoy.



DIGGING UP OUR VIKING PAST

THE third in Sherston's impressive *Arcventure* series, *Arcventure III: The Vikings,* has just been launched. This latest exploration is aimed at seven to 11-year-olds and includes an introductory movie sequence complete with musical soundtrack. Based around the archeological excavation at Coppergate in York (Jorvik), it allows pupils to dig and see what they find, with help from a computer containing details of objects that might be discovered. Pupils also travel back in time to Viking England to explore and meet people and ask questions about the objects they have dug up. The pack includes extensive resource materials, including sprite and *Draw* files which can be transferred to other applications. Priced at £31.95 and available on 28 days' approval, for further details call Sherston on (0666) 840433.

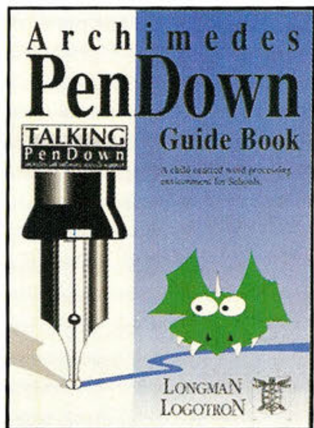


In Arcventure III, children excavate and then investigate Viking artefacts

Widgit Software has also produced the *Viking Library*, a resource pack comprising over 250 symbols and words, intended to help children read and write about the Vikings. Designed for use with the literacy software *From Pictures to Words,* the pack also comes with a story about the Vikings which covers fighting, living, food stuffs and other facets of Viking life. *Viking Library* costs £12.50 and is available from Widgit on (0926) 885303.

TALKING PENDOWN

LONGMAN Logotron has announced the final release of *Talking Pendown.* The new version, which says exactly what is typed and won't ignore mistakes, was linked to the Somerset Talking Computer project. This combined IT and traditional methods to help children with serious reading difficulties and complementary materials from the project will be published in the autumn. Priced at £64 (£120 for a primary site licence), no extra hardware is necessary and upgrade paths are available for existing *Pendown* owners. Further details from Longman Logotron on (0223) 245558.



SCORING TOP MARKS

TEN out of Ten Educational Systems has announced that the latest in its popular series will be *10 out of 10 Maths (Algebra).* Due out at the end of June, the pack contains six games covering ten essential areas of algebra, including sequences, formulae, graphs, equations, symbols and inequalities. Aimed at ages six to 16, graphics are automatically targeted at the ability of the pupil and each game can be played at a variety of levels. All settings can be overwritten and progress is monitored and displayed. The disc also contains a free game, *Wordfit,* which helps children spell algebra-related words.

The program costs £25.95 and comes on 14 days' trial. Information on (0742) 780370.

National Curriculum relevance is high in this new algebra program

ACTIVE-IT

SUPERCHOICE Adventure and Acorn have launched a series of courses called Active-IT, which combine outdoor activities and IT sessions. Four labs have been installed at a centre in Dorset, each kitted out with 12 A5000s linked to Nexus shared hard disc systems. Software is plentiful and hardware includes laser printers, scanners and data-logging equipment. There are also Pocket Books for off-site work and tuition is provided.

Outdoor activities include abseiling, climbing and archery. Data can be collected and transferred to the IT room for further work.

iThe local area also provides opportunities for study visits and worksheets on the Pocket Books can be set up to suit schools' needs. Any combination of IT and activities can be arranged.

Prices range from £47 for a weekend to £175 for a week in high season. Teachers with ten pupils go free. Superchoice is on (0273) 676467.

PACKS FOR FREE

RICKITT Educational Media has announced a Software Incentive Scheme for Schools. A free colour magazine, called *The Educational Software Review*, lists a wide selection of software for all types of home computer.

Parents who nominate a school when buying software will be sent a voucher for 10% of the order value, which the school can then use towards purchasing the software of its choice. The scheme is expected to run indefinitely and details are available from Rickitt Educational Media on (0460) 57152.

Your RISCOS Compliant Acorn Dealer.

QuickTile (v1.01) £25+VAT

Up until now it has only been possible to print posters from Draw & Sprite files. Now with QuickTile you can create posters from ANY RiscOS application. Simply enter the size of poster required and select PRINT directly from the application! QuickTile does the rest, printing each tile with crop marks and tile reference.

Requires RISCOS 3.10 or later.
Send v1.00 disc back for free u/g.
Upgrade from Tiler for £15+VAT



TopicArt

A new form of clip art comprising of single discs containing approximately 50 hand drawn high quality draw format clip art images, each on a single subject. Site and area licences are available, please ring for details.


TopicArt9 - Dinosaurs

Subjects available
1 - General
2 - Transport
3 - Costumes
4 - Entertainment
5 - Bugs 2 Slugs
6 - Road Signs
7 - Sports Equip
8 - Sports Figures
9 - Dinosaurs
10 - Symbols
11 - Tools

£8 + VAT per disc

11 TopicArt subjects are available now. Please specify when ordering.

Buy 4 TopicArt discs get one free
Not inc SpecialArt


TopicArt7 - Sports Equipment


TopicArt4 Entertainment

Showroom

Come and visit our Showroom, most Acorn systems & software on demonstration. Free car park.

Finance 28.9% APR

Finance is available on all Acorn hardware. 13.75% APR finance is available to teachers etc.

Acorn Ext Warranty

1 Year On-Site Service

A3010, A3020 or A4000	£25
A5000	£34

3 Year Warranty & On-Site Service

A3010, A3020FD	£42
A3020HD, A4000	£51
A5000	£68

The above must be purchased at the same time as the computer system. Call for further details.

Ink Jet Refills

Why throw away empty inkjet cartridges... ...when you can refill them at a fraction of the cost

Colours available include
Cyan, Magenta, Yellow, Black, Red, Green, Blue, Brown

Single Refills (req an orig cartr.)	£7
Twin Refills (req an orig cartr.)	£12
Please specify colour(s) required	
125ml Cleaning Kit	£4
400ml Cleaning Kit	£10
ColourSep software	£15

Can be used with HP DeskJets, Canon BJ's (not BJ300), JP's + others. Ring for further details.

SpecialArt £20+VAT (each)

Special editions of TopicArt consisting of a minimum of 4 discs full of clipart





Hardware & Books (All prices exclude VAT)

Pocket Bk/Psion

Acorn Pocket Book	**£212**
Psion 3 256k	**£185**
A-Link for either of the above	£51
Call for other peripherals	

A3010 Series

Free 3 Year Ext Warranty & On-Site Maintenance

Family Solution £424
Connects to std TV. 1Mb RAM, Floppy drive, 2 joystick ports.

Learning Curve Sys £680
As above with 2Mb RAM, Standard Monitor & Learning Curve software.

A3020 Series

Free 3 Year Ext Warranty & On-Site Maintenance

Floppy Disc System £749
As A3010 less LC software & joystick ports. Inc Std Monitor, 2Mb RAM.

60Mb Hard Disc Sys £899
As above with 60Mb Hard disc.
Add £50 for MultiScan Monitor.

A4000 Series

Free 3 Year Ext Warranty & On-Site Maintenance

Home Office System £999
2Mb RAM, Floppy Drive, 80Mb HD, Std Monitor, EasiWriter2, Jr Database

80Mb Hard Disc Sys £949
As above without additional software
Add £50 for MultiScan Monitor.
For 1Mb 386 PC Card add £250
For 4Mb 486 PC Card add £450

A4 Portable

Free TrackBall, Spare Batt

A4 2MFD Portable £1399
A4 4MHD Portable £1699
4Mb RAM, 60Mb HD, 2Mb Floppy Disc, LCD Screen, PC Emulator.

A5000 Series

Free 3 Year Ext Warranty & On-Site Maintenance

Learning Curve Syst £1445
2Mb RAM, 80Mb HD, MultiScan Mon, Learning Curve Software.

A5000 2MHD80 Syst £1399
A5000 4MHD162 Syst £1599
Add £175 for Microvitec CubScan 1440 Monitor

RAM Upgrades

A3000 up to 2Mb	£45
A3000 up to 4Mb	£129
A3010 up to 2Mb	£39
A3010 up to 4Mb	£149
A3020/A4000 2Mb	£79
A5000 2Mb	£79
A5000 up to 8Mb	£399
Please call for details	
A400 RAM	£35 per Mb
A540 4Mb	£255

Printers

Canon BJ-10sx	£179
Canon BJ-10 Sht Fdr	£49
Canon BJ-200	£279
Canon BJ-230	£309
Canon BJC-800 Turbo	£1299
HP DeskJet 500C	£379
HP DeskJet 550C	£539
Add £35 to above printers for CC's TurboDriver	
HP LaserJet 4 600dpi	£Call
LaserDirect HiRes4	£949
LD HiRes4 Card	£349

Scanners

ScanLight 256	£199
ScanLight Professional	£549
SCSI Card for above	£139

Monitors

Acorn Colour AKF30/40	£199
Acorn MultiScan	**£249**
add £10 for Archi/A3000's	
Microvitec CubScan	**£399**
0.28dp, 40 presets & 3 year warranty	
Philips 1710 17" FST	**£849**
0.26dp, 26 presets & 1 year on site	

Upgrades

386PC 1Mb/4Mb	£390/£490
486PC 1Mb/4Mb	£490£590
A4k 1Mb 386PC Card	£275
A4k 4Mb 486PC Card	£499
5.25" Disc Buffer Archi	£39
5.25" Disc Buffer A5k	£35
ARM3 25Mhz	£175
Colour Card (CC)	£249
DeltaCat Joystick	£29
Dust Covers 2 piece	£12
Dust Cover A30?0	£8
FaxPack (CC)	£279
I/O Expansion Card	£79
Joystick I/F (All M/C's)	£32
Midi Expansion Card	£65
Micro Mouse (Clares)	£29
NetGain Ether or Eco	£200
NetGain 10 User u/g	£100
Parallel Sound Sampler	£41
Serial Upgrade A3000	£17
Speedking Joystick	£10
User/Midi Card A3000	£46

Digitisers

Hawk V9 MkII	£249
Hi-Vision Col Digit'r int	£129
Vision Mono Digitiser int	£48
Vision Color Digitiser int	£76
Vision Mono Digitiser ext	£60
Vision Color Digitiser ext	£89

RISCOS 3.1 A300	**£63.83**
RISCOS 3.1 A5000	**£16.17**
RISCOS 3.1 Others	**£42.70**

Acorn Books

A30X0 Technical Ref Manual	£29.95
A4 Technical Ref Manual	£65.00
A540 Technical Ref Manual	£65.00
A5000 Technical Ref Manual	£65.00
Assembler Manual	£25.00
ANSI C v4 Manual	£25.00
BBC Basic VI Guide	£19.95
1st Word+ Manual	£10.00
DDE User Guide	£25.00
DTP Manual	£10.00
RISCOS 2 User Guide	£15.00
RISCOS 3 PRM's	**£99.00**
Call for books not listed	

Other Books

Archi Game Maker's Manual	£14.95
Archi Assembly Lang Manual	£14.95
Archi Operating System Guide	£14.95
Begin. Guide to WIMP Prog.	£12.95
Budget DTP	£12.95
Dabhand Guide to Impression	£14.95
DTP on the Archimedes	£12.95
Graphics on the ARM M/C's	£14.95
Mastering 1st Word+	£13.95
First Impressions	£35.00
Good Impressions	£30.00

Ink Cart/Ribbons

BJ-10/20 Ink Cartridge	£17
BJ-300 Ink Cartridge	£12
DJ-500 Bk Hi-Cap Cart.	£22
DJ-500C/550C Colour Cart.	£23
Swift24 Mono/Colour	£5/£15

Ordering by Telephone

Please specify the goods you require and for which computer. Please have your credit/debit card ready. We will require the cardholders name, address, delivery address if different and the start & expiry dates of the card.

Ordering by Post

Please specify the goods you require and for which computer including your TELEPHONE NUMBER & delivery address. Send complete with a signed cheque/postal order or alternatively for credit/debit cards, the card number, cardholders name, address, and the start & expiry dates. IMPORTANT - Please write your name, address & credit card details in BLOCK CAPITALS to avoid confusion. Orders by post **MUST** be accompanied by a telephone number.

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From the M63 Junction 12 roundabout follow signs to Cheadle A560 passing the glass pyramid. At the 2nd set of traffic lights turn left onto Brinksway. Turn next left onto Chester St and immediately left again onto Ford St. Enter on-site car park via Red Gates on the right hand side.

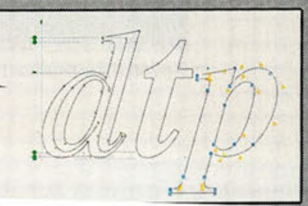
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A560
To A6
A5145
M63
To M56/M62
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Ford St
Brinksway/Chestergate
ONE WAY
Wood St
ONE WAY
King St W
A560

Desktop Projects Ltd

All prices exclude VAT



Authorised Acorn Dealer (Tel: 061-474 0778, Fax: 061-474 0781)
Unit 2A, Heapriding Business Park, Ford St, Stockport, Cheshire, SK3 0BT

Opening Hours Monday-Saturday 10.00 to 18.00

QuickShow £25+VAT

!QuickShow Video Titling & Slide Show Presentation — Has never been easier!

The easy to use slide show presentation and video titling package. Create sequences of frames containing text of any colour with drop shadows, outline shadows and rubout boxes using the RISCOS fonts. Sprites can also be included in frames and positioned and resized as necessary. Several screens can be linked together with the sequencer which allows you to fade each screen out and in with the many fades provided. Completed sequences can be converted into stand alone applications which when run, shows the sequence without using !QuickShow. 2Mb RAM required and hard disc is recommended.

QuickSnd £10+VAT

Load, play, convert & resave existing Armadeus, Tracker and raw data sound samples and apply special effects including Reverse, Echo, Max Vol, alter replay rate and resample frequency. Convert samples into modules for use with the RISCOS sound system etc. Create stand alone Utility modules which when called, via star commands, automatically play and then remove itself completely from memory (this feature is not available on any other sound package). Use Utility sound modules with RISCOS Alarm to play on activation of an alarm. On screen VU meter included.

Acorn/Cumana Multimedia

Acorn Multimedia Expansion System — £499

Comprises A4000 style case complete with power supply, SONY multi-session CD-ROM drive, pre-amplifier with headphone/phono inputs/outputs, CD caddy, etc. The unit can also house a 3.5" SCSI hard disc and another CD-ROM drive or Magneto Optical SCSI drive.

External Toshiba CD-ROM Drive (The fastest available) — £399

The above drive is a triple spin speed unit and is PhotoCD compatible. The unit is housed in its own case with power supply and comes with one caddy.

Magneto Optical Drives (SCSI)

128Mb Magneto Optical SCSI Drive 28ms 1" high — £749

The above unit is a bare drive and can be mounted in the spare floppy bay of an A5000 or in an external case for other machines. SCSI interface extra.

External case for above — £69

128Mb Blank Discs — £39

Add £139 to above prices for SCSI Interface (specify which machine)

Hard Discs

The no nonsense RISCOS 3 compatible HardDisc solution

IDE

The following are complete systems comprising of the NEW Desktop Projects IDE interface, hard disc, mounting brackets, cables, utilities disc and manual. **RISCOS 3.10 or later required.**

Archimedes 3.5" Internal
Not suitable for A3k,A3010-A3020

40Mb 17ms	£175
120Mb 16ms Cache	£275
200Mb 13ms Cache	£375
330Mb 12ms Cache	£Call
520Mb 12ms Cache	£Call

Archimedes 2.5" Int Hard Card
Not suitable for A3010-A3020

80Mb 28ms NEW	£295
120Mb 28ms NEW	£375

add £15 to above for A3000 Ext

A3000/Archi/A5000 External

40Mb 17ms	£255
120Mb 16ms Cache	£355
200Mb 13ms Cache	£455
330Mb 12ms Cache	£Call
520Mb 12ms Cache	£Call

A5000 Second/Exchange Drives

For A5000's only.	2nd	Exch
120Mb 11ms Cache	£235	£185
250Mb 15ms Cache	£345	£295

A3020 Hard Disc Upgrades

80Mb Internal 28ms NEW	£249
120Mb Internal 28ms NEW	£299

HCCS A3000 IDE Hard Cards

20Mb Internal+User Port	£179
60Mb Internal+User Port	£269

HCCS Ultimate Multi-Podules With IDE Hard Disc

	A3000	A3010
20Mb Internal	£269	£269
60Mb Internal	£399	£399
80Mb Internal	£399	£399

SCSI

The following are complete hard disc systems comprising of a Morley SCSI interface, HardDisc, brackets, cables, disc & manual.

Archimedes Internal
Not suitable for A3k,A3010-A3020

120Mb 18ms Cache	£395
200Mb 18ms Cache	£545
330Mb 12ms Cache	£Call
520Mb 12ms Cache	£Call

A3000/Archi/A5000 External

120Mb 18ms Cache	£475
200Mb 18ms Cache	£625
330Mb 12ms Cache	£Call
520Mb 12ms Cache	£Call

Removable Hard Discs

44Mb (Inc one cartridge)	£499
44Mb Cartridge	£55

The above are ext units with card.

SCSI Controller Cards

Morley Uncached	£139
Morley Cached	£179

Archimedes, A3000, A5000 Software

Applications

ABC Compiler (Oak)	£77
Advance (Acorn)	**£95**
Ancestry (Minerva)	£59
Arc DFS (Dabs)	£22
ArcComm2 (Logotron)	£52
ArcLight (Ace)	£40
ArcTerm 7 (Serial Port)	£62
Arctist (4D)	£20
Armadeus (Clares)	£65
Artisan 2 (Clares)	£49
Art Works (CC)	**£129**
AUN/Level 4 FileServer (Acorn)	£395
Autosketch v2 (Autodesk)	£65
Cable News (Lingenuity)	£165
CADet (Minerva)	£139
Chameleon 2 (4Mation)	£35
ColourSep (ICS)	**£15**
Compression (CC)	£35
Control Panel (Lingenuity)	£14
Desktop Assembler (Acorn)	£125
Desktop C (Acorn)	£180
Desktop Office (Minerva)	£95
Desktop Thesaurus (RISC Dev)	£19
Digital Symphony (Oregan)	**£40**
Draw Print-Plot (Oak)	£39
EasiWord 2 (Minerva)	£55
EasyWriter II (Icon Tech)	£126
Einstein (Ace)	£106
Equasor (CC)	£37
Euclid 2 (Ace)	£55
Eureka (Longman)	**£99**
Font FX (DataStore)	£9
Gammaplot (Minerva)	£36
Genesis 2 (Oak Solutions)	£109
Graphbox v2 (Minerva)	£57
Graphbox Pro (Minerva)	£109
Hard Disc Companion II(RISC)	£45
Hearsay II (RISC Dev)	£69
Hotlink Presenter (Lingenuity)	£41
Home Accounts (Minerva)	£34
Illusionist (Clares)	£79
Imagery (Palette Studios)	£69
Impression v2 (CC)	**£125**
Impression Junior (CC)	£75
Impression Bus Supp (CC)	£39
Inter-Sheet II (CC)	£30
Inter-Word (CC)	£30
MasterFile III (RISC Dev)	**£47**
Midnight Express (Mid. Graph.)	£39
Mogul (Ace)	£20
Notate (Longman)	£54
Ovation (RISC Dev)	£95
PCB (Oak)	£99
PC Emulator (Acorn)	£95
PenDown Plus (Longman)	**£68**
Pin Point (Logotron)	£79
PipeDream 4 (Colton)	**£119**
Playback (RISC Dev)	**£17**
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ProArtisan2 (Clares)	**£110**
ProDriver DJ500C/550C (Ace)	**£39**
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Render Bender v2 (Clares)	£99
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Revelation II (Logotron)	£110
Revelation ImagrPro (Logotron)	£127
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Rhapsody v3 (Clares)	£79
RISCType (CIS)	£16
Rythmn Bed (Clares)	**£40**
S-Base Personal (Longman)	**£79**
S-Base Developer (Longman)	**£175**
S-Base Developer + (Longman)	**£275**
Schema (Clares)	£99
Serenade (Clares)	**£109**
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ShowPage (CC)	£130
Sleuth (RISC Dev)	**£47**
SmArt (4Mation)	£50
SmArtFiler (4Mation)	£32
Snippet (4Mation)	£35
Sound FX Maker (CIS)	£32
Speech! (Superior)	£15
Splice (Ace)	£27
Squirrel Database (Dig Serv)	**£120**
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Vox Box (Clares)	£49
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Wordz (Colton)	**£95**
Worra CAD (Oak)	£83

Items in red are New/Low price

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2067BC (Oregan)	£17
Aggressor (Atomic)	£19
Air Supremacy (Superior)	£17
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Battle Chess (Krisalis)	**£22**
Black Angel (4D)	£26
Blaston (Eterna)	£15
Blitz (Arxe Systems)	£15
Boogie Buggy (4D)	£19
Break 147 & Superpool (4D)	£26
Bug Hunt, MoonDash (Min)	£15
Bug Hunt in Space (Minerva)	£15
Cataclysm (4D)	£19
Champions (Krisalis)	**£22**
-Includes Man Utd, J Khan Squash,	
-Wld Class Leaderbrd & Boxing Mngr	
Chess 3D (Micro Power)	£19
Chocks Away 2 (4D)	£19
Chocks Away Extra Miss(4D)	£15
Chocks 2 Compendium (4D) **2Mb**	£26
Chopper Force (4D)	£22
Chuck Rock (Krisalis)	£19
Cyber Chess (4D)	**£26**
Cyborg (Alpine)	£19
Cycloids (Software 42)	**£19**
Dragon's Lair (4D)	**£19**
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Dungeon (4D)	**£26**
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E-Type Compendium (4D)	£19
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Iron Lord (Cygnus)	£15
Ixion (Software 42)	**£19**
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Kerbang (Eterna)	£15
Krisalis Collection	**£22**
-Includes, Mad Professor Mariarty,	
-Pipemania, Terramex & Revelation	
Last Ninja (Superior)	£19
Legend of the Lost Temp **(OS2)**	£19
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Loopz (Audiogenic)	£19
Lotus Turbo Challenge II (Kris)	£19
Mah-Jong Patience (CIS)	£15
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Mig-29 Fulcrum (Domark)	**£25**
Nebulus (Krisalis)	£19
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Pesky Muskrats (Coin-Age)	£19
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-Includes Conqueror, Rotor,	
-No Excuses & Hostages	
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-The Olympics & Inertia	
Real McCoy 3 (4D) 2Mb	£26
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-Ship & The WIMP Game	
Real McCoy 4 (4D)	**£26**
-Includes Galactic Dan, Grievous	
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Saloon Cars Deluxe (4D)	£26
Saloon Cars Del Extra Courses	£15
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Waterloo (Turcan)	£19
X-FIRE (4D)	£19
Zarch (Superior)	£15
Zool (Gremlin Graphics)	**£22**

2Mb - RAM required for RISCOS3.1
OS2 - Runs on RISCOS2 only

Education

Adv. Playground 5+ (Storm)	£17
Amazing Ollie 4+ (Storm)	£14
Badger Trails (Sherston)	**£37**
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Converta-Key	£15
Crossword+ 8+	£19
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Freddy Teddy's Adv (Topol.)	£17
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Fun School 2 (Database)	£15
Fun School 3 (Database)	£18
Fun School 4 (Database)	**£18**
(Please spec. age group <5, 5-7, >7)	
Giant Killer (Topologika)	£17
House of Numbers (Chalk)	£19
Hyperbook Reader (Logotron)	£48
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Letters and Pictures (Chalk)	£18
Logo (Logotron)	£60
Magpie (Logotron)	£49
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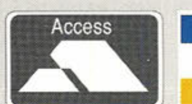
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This document was produced entirely on the Archimedes using Impression, ArtWorks, Draw & Paint.

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AUG 93

Read all about it

Harlington Upper School publishes its very own tabloid newspaper, Grapevine, using the Ovation DTP application. Louise Graham went along to see how they do it

The days are numbered for the old school newsletter, those cobbled together termly events produced with typewriter, photocopier, scissors and glue. Harlington Upper School is forging a new way ahead with its Acorn-produced school newspaper, *Grapevine*, whose production standards would shame many a local free-sheet.

The paper is the brainchild of English teacher Chris Thursby who is sitting in his Harlington School staffroom and proudly flicking through the latest issue. It is all produced on his Acorn machine using *Ovation*. According to Chris 'it's the gossip, or what we call the graffitti page that has proved the most popular. But we also cover school events, skiing trips and so forth. So it's a paper about the school'.

Keen to keep the newspaper lively Chris, with an eye on the national tabloids, introduced a page three girl and a page nine 'hunk of the month'. Fear not, these are innocent profiles and feature pictures of a couple who have been going out together for a long period. Says Chris: 'They pretend they don't want to be featured but it hardly takes any persuading at all really.'

The rest of the paper covers news, pieces from teachers and articles by students on everything from hobbies to drama and sport.

Fundraising

The paper's budget comes not out of school funds but through an enviromentally friendly link-up with several local businesses. 'We collect waste paper, used laser printer toner cartridges and empty aluminium drink cans from local firms,' says Chris, 'and in the school we collect all waste paper. The proceeds pay for the newspaper and the students are very keen on recycling anyway, so it works very well'.


Grapevine

May 1993 The student newspaper of Harlington Upper School No. 30

FLITWICK LEISURE CENTRE | Optim | GRANADA | KANGOL OF LUTON | COMMERCIAL UNION General Insurance | Poplars Garden Nursery Centre

HOME RUN TO KANSAS CITY

KANSAS CITY USA, home of the famous Royals baseball team, was the destination for a party of twenty-three students and three staff last Easter.

They were taking part in the first leg of an exchange visit between students from Harlington and Lee's Summit High School, Missouri.

After eighteen hours of travelling the group was met at the airport by a noisy, colourful party and taken to the houses of their host families.

FULL DETAILS OF THE VISIT INSIDE ON THE CENTRE PAGES

The next two weeks were spent experiencing the life of a large American school (2500 students) and socialising with new friends. Our students soon settled into the routine of the day (starting at 7.40 am), enjoying the different courses on offer and visiting classes that had requested the presence of British students.

Excursions included an evening of comedy improvisation, shopping trips, a Kansas City tour and a visit to the Royals stadium to see the baseball team in action. The schedule was very busy and interesting with hardly a moment to spare.

It was with much sadness and a few tears that the group left America for the long journey home. They are looking forward to receiving the US students, however, when they arrive here for the return leg in June.

The welcoming pa...

National success for Harlington music

FOR the second year in succession, Harlington Upper School musicians have achieved success in the prestigious National Festival of Music for Youth.

Following the regional finals, in which over 25,000 young musicians took part, the School Jazz Group and the School Contemporary ... Ensemble have been ... compete in the ... South

INSIDE: Retirement 2, Page 3 Girl, News 4, Pastimes 5, Exchange visit...

4 GRAPEVINE Summer 1993

news

Granada executive visits Harlington

Back to school

Careers Fun Day!

Geographers go Walkabout

A wheelie good idea

Grapevine: created with Ovation and a little bit of flair

The labour force for the recycling project is provided by students and teachers, and a local printer runs off 1200 copies for a modest £400. However, computerisation has not quite reached every corner of the operation. 'Because the printing company we use is geared up for using Apple Macs I can't just send off an Acorn disc, so I print out everything on the laser printer,' explains Chris. 'The printer is unfortunately only A4, so I have to print each page in three parts and then cut and paste it onto an A3 sheet.We don't have the scanners for photographs so the printing company deals with the scanning.'

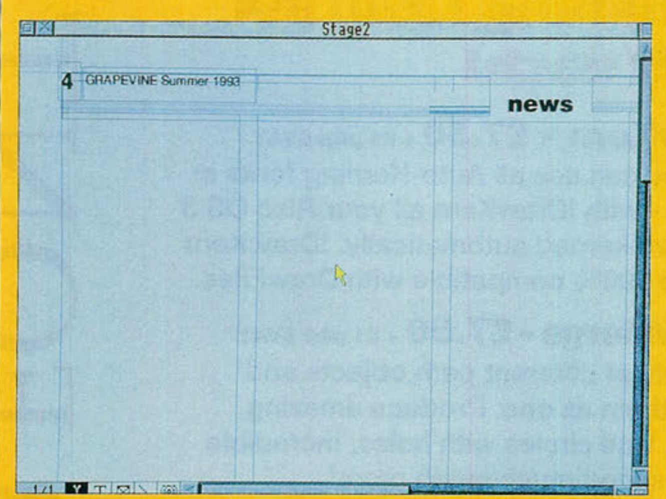
Putting together the first issue of *Grapevine* was a time consuming process. 'It took me about three weeks of evenings and weekends to do the first issue. But I had to set up the master pages and decide on the fonts and everything, so that was an unusually long time, I hope. The font size is larger than on most papers but if it was too small it might put off some of the students.

'I use a serif face for the main bodytext (Trinity), along with sanserif Homerton for the smaller headlines, because they're easy to read and look very modern, which is important for a school paper. I also use Newhall for headlines because that's good and strong.

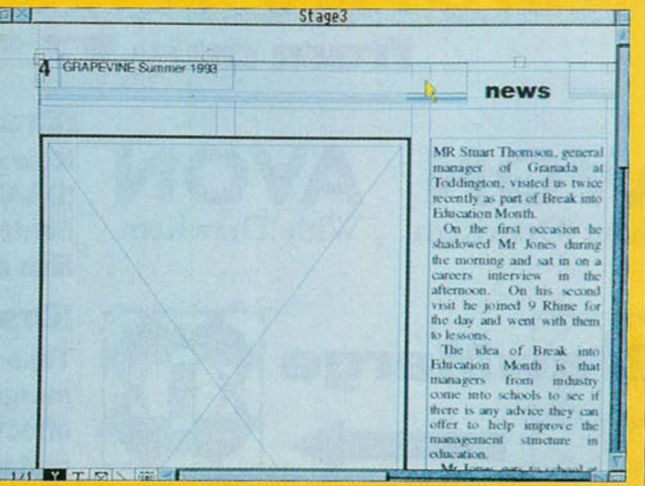
'Basically I stole all the ideas from other papers. I got hold of all the tabloids and lots of regional papers and slavishly pinched other peoples ideas. The headline sizes come from the *Daily Express* for example. I also pinched the sports page layout from the *Express*. And I noticed how papers used lines to divide articles and capitals at the beginnings of paragraphs to draw people in. And I chose to have a five column layout because it gives more flexibility.'

Chris has learned a lot from the first issue. 'The next thing I'm going to buy is a large monitor. I spent so much time reducing the page so I could see how it would look that it was driving me mad on a normal size monitor.' Moreover to capitalise on the paper's success he's about to approach local firms for advertising rather than for just old paper and drinks cans. 'I'll call them up and see if they're interested. If they want to

The four stages of *Grapevine*



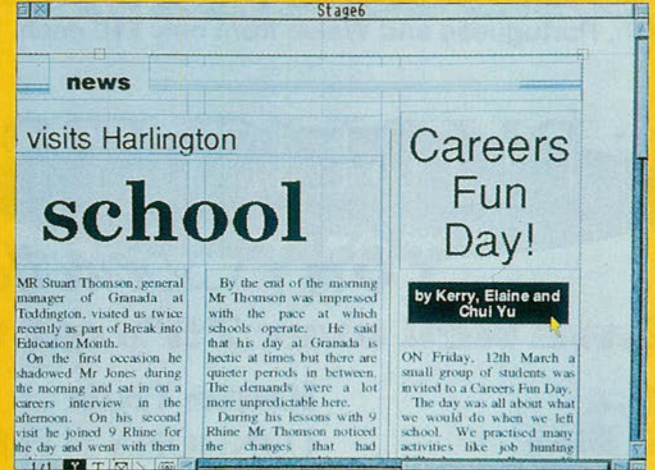
STAGE ONE: When setting up the master page, Chris went for five columns to allow greater flexibility in arranging the photographs and articles on the page, as four columns only allows articles two by two or one by three. The masthead consists of the page number, title, headline and decorative top border. Chris designed his own sprite for the masthead in *Paint* and dropped it into two picture frames on the page.



STAGE TWO: The photograph to go with the main story was just over two columns wide so it was reduced slightly at the scanning stage. The length of the story then roughly depended on the size of the picture so that the text and photograph would match up. Chris decided to use quite a large font size for the main text (11.5pt Trinity with 5 per cent leading) to make the page more attractive to its young readership.



STAGE THREE: The headline was influenced by the Daily Express and Chris copied the Newhall typeface of their headlines. The 'strapline' above was put in Homerton, a sanserif typeface for a good contrast. The story about the careers day was then just long enough to fit in a single column down the right hand size. Separating articles using thin lines and capitalising the first word were two ideas from the national press.



STAGE FOUR: The careers day article was given a large headline and a reversed byline to attract the readers eye. When using reversed out text, Chris recommends a sanserif typeface as this gives it a clean appearance. Finally the entire page was printed out in three sections (to allow the join to be made in the most suitable place) and sent to the printers with the photographs to be scanned.

attract young teenagers I think a school newspaper might be a good place to advertise.'

Grapevine's success ties in neatly with the Newspapers In Education project which runs from a head office in Tonbridge Wells to encourage a link-up between schools and local papers. Several local papers have a page designed and written by students. Says Chris: 'If you don't want to produce a complete newspaper, this is a good option to go for. The kids are learning about newspapers, about the media. I think it improves their writing and communicatiuon skills. Next year when we start running a media course, I hope to get the students more involved in actual production, subbing and so on. Obviously the students already have a great deal of commitments with school work but it's a very worthwhile exercise.'

On next month's subscriber's disc we will provide a complete Ovation file of the Grapevine newspaper.

Five tabloid tips

If you are thinking of starting up a school newspaper, there are a few basic guidelines. Here are some of Chris' tips for starting a succesful tabloid.

- Shop around. Printing firms often charge differing amounts for the same job and it is well worth getting several quotes.
- Lift ideas from other publications. Look carefully at all the newspapers you can and steal ideas shamelessly.
- Never use too many fonts. This is the most common DTP error and makes any document look amateurish.
- Get as much input as you can from anyone who knows about the printing business. A good starting point would be to read *The Teacher's Guide to Publishing a Newspaper*, available from the Northcliff Newspapers in Education project, tel: (0892) 512321.
- Break up the page with small stories, mini-headlines and so on. This makes the page look far more appealing.

LEARNING CURVE

Wordprocessing is a basic skill, so why get it wrong? John Rennie looks at the write stuff

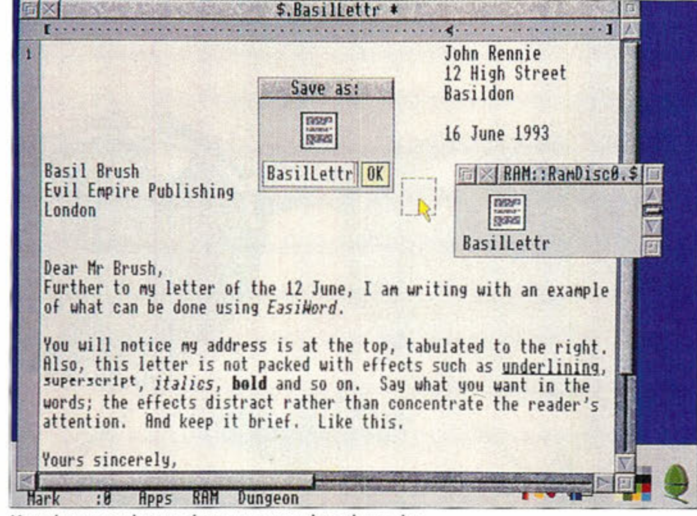
So you've got your shiny new A3010 plugged in and ready to go. But go where? Okay, you may spend the first six months of your home computing existence murdering aliens and saving lemmings, but then there is that nagging recollection that you bought a computer for its educational value, as an art tool, as a wordprocessor. Maybe even to put together your own magazine.

Over the next few months we are going to look at some of the things you can do with your Acorn, with some of the applications that come as standard with your machine. It should serve as an introduction for new users and help you get the most from your computer.

One of the most popular applications is the wordprocessor. This makes sense. Whether you are writing letters, novels or essays you want to be able to submit your finished work in intelligible form. The wordprocessor gives you the quality of typing without the hassle of hitting carriage returns at the end of lines and, if your typing's like mine, saves on copious amount of Tippex. Typing for non-typists.

There are a multitude of packages, some marvellous, some miserable. Each has its own loyal fans. The good news is you don't have to shell out for one. *EasiWord* comes as standard with the A3010 and, ignoring the old adage that you get nothing for nothing, it's actually very good.

The conventions that normally apply with your machine apply with *EasiWord*, so when I click the middle mouse button I get the main menu; if I move across the Select option to its submenu I find CTRL-C copies text and CTRL-V pastes it; the Effect submenu not only has text effects – bold, italic and so on – but lists standard keypresses. All this helps flatten the learning curve.



Keeping your letter short, neat and to the point

MENU SYSTEM

The File submenu gives you all running information on the file you are working on: filename, whether you have modified the file since your last save, and how many words and lines you have churned out – vital for students or journalists, who write to length. In File you also have the standard save box (with keypress shortcut F3), where you can save your file either as a standard text file, or preferably as a 1st Word+ file which retains all the text effects you have used. You'll also find Print in here.

I've taken a standard letter to demonstrate basic word processing with *EasiWord*. Easy eh? Well, no actually. Judging by the letters we receive with dodgy spacing and Martian spelling there's a lot of people out there not taking care of the basics. First off, decide how the finished article is to look.

Ranging addresses to predefined places on the page is no problem, that's what the tabs are for. Open your *EasiWord* file by clicking once on the icon on the icon bar with the left-hand mouse button and the tabs are set at 5cm intervals on the ruler along the top of the page. You want to alter them? Fine. Double-clicking on a tab in the ruler deletes it; double-clicking on a space on the ruler deposits a tab.

Alternatively, click on Edit ruler in the Edit submenu and you can reset all tabs, alter the page width and decide whether you want your text justified (like the words on this page) or ragged (take a look at 'Cheats' in Game Show). If you are writing a letter, you will want at least one tab for your address on the right (as in the shot above). Setting further tabs will allow you to have one, two, three or more columns ranged neatly across the page: useful for laying out a CV, for example.

The shot on this page gives you an idea of how you want your letter laid out. If you make a mistake, no problem. You simply highlight the bit of text you want to replace by clicking your left mouse button at the beginning and the right button at the end, then type in the corrected text. If you decide the paragraph you ended with is simply so good you want to move it to the start of the piece, you Delete and Paste – and your text is shuffled into position.

If you want to repeat a sentence, word or paragraph, just Copy and Paste and, as well as being copied, the original text will be left in place. If you are writing a CV or job application you really should resist the temptation to put text in 17 different sizes using a dozen different effects. That said, the Effect submenu gives you all variations you need to highlight text: bold, italic, underlined, subscript or superscript. You can highlight text and swap it from upper to lower case. Again, quick keypresses are listed beside commands.

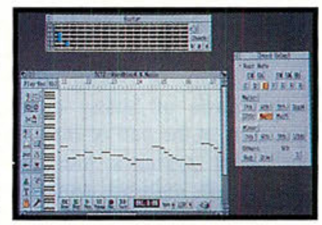
When you have finished, Page layout gives you a thumbnail view. Now you can look at the margins all round your text and adjust them to the best effect. You can still make changes here. The Utilities menu deals with all the bits and pieces. You'll find the spelling checker here (none of us think we make mistakes, then we see the thing in print and find we've spelt errror with three r's).

Find and replace is invaluable if you have made a mistake, say on a person's name, the whole way through your letter. GoTo lets you go to the beginning, end, or any page or paragraph.

I'd challenge you to find an easier fit for writing with your Arc than *EasiWord*. But that's enough words. Next month we burst into full colour as we explore the creative possibilities of *Draw*.



YOUR OWN 16 TRACK MIDI RECORDING STUDIO

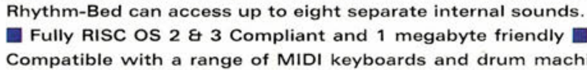


Serenade is a desktop MIDI sequencer for the full range of Acorn RISC OS machines. A great deal of effort has gone into creating a graphical user interface that gives access to the power of Serenade without making it complex to use.

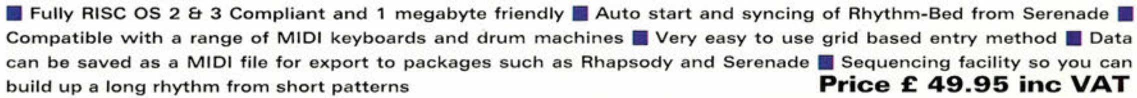
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The cutting edge

Eidos used Acorn technology to revolutionise the video editing business. Now it plans to bring the same facilities to your desktop. Ian Burley gets the full picture

Full motion video (FMV) on the Archimedes is about to be given a useful boost with the arrival of a new real-time digitising and compression system from Eidos which will complement *Replay*. Eidos is also bringing Archimedes users the fruits of its experience in the professional video and movie editing market with a sophisticated digital movie editor.

Eidos was set up in 1989 by professional video editor, Nick Davies and Archimedes owner, Stephen Streater. Acorn's Roger Wilson – inventor of *Replay* – is a non-executive director. The story starts when Nick bumped into Stephen, who was doing a PhD at King's College London. Stephen had been experimenting with video animation on an early monochrome video digitiser with his Archimedes. Despite the relatively-primitive results of Stephen's experiments, Nick was struck by the potential of digital movies in his own field: video editing. Traditional video editing, still dominant today, involves endless winding and rewinding of video tape reels or cassettes, viewing raw takes, thus determining edit points and the running sequence. This is known as linear editing in the trade; serial in computer terms.

Nick knew a non-linear or random access way of viewing the recorded video would make life much easier for tape editors and cut costs too. The solution was to use a computer – the Arc – to enable instant viewing and editing of any section of a digitised movie. Eidos went on to develop a sophisticated Archimedes-based video digitising and software compression engine

The professional system

Professional video editors don't usually edit their programmes online, straight from raw master tapes. Online editing equipment is very expensive and so is hiring an online editing suite. It's much cheaper to edit the programme offline, creating an accurate facsimile of the eventual programme but using cheaper equipment. Once you have made your dummy offline programme you will have a comprehensive list of editing instructions like time-code edit points, audio and video fades, which can be applied directly to the original master tapes during an online editing session.

Offline editing is a time-consuming process. There could be literally dozens of original tapes and inevitably finding a desired sequence will involve searching miles of tape. This is a linear or serial process – you can't just jump straight to a part of the tape like you can with a CD. But you can if you digitise the video onto a hard disc or, better still, a portable high capacity MO (magneto-optical) disc. This random access ability is non-linear.

Eidos set out to produce such an offline non-linear editing system back in 1989 using the Archimedes as its platform. Two things needed to be created: a fast and efficient digitising and compression system and a flexible digital video editing application.

After three years of development the results are *Compressor* and *Optima*. The former is a real-time 25FPS video digitising and compression system which uses an 8Mb Archimedes A540 to create digital movie files on 650Mb magneto-optical (MO) removable discs. The A540 uses a special card for the video digitising, but compression is carried out entirely in software. As compression is real-time, the system is symmetrical – digital recordings can be made at normal playback speed. Stephen Streater developed a completely new *ESCaPE* compression algorithm for the system. *ESCaPE* compression is highly efficent with frame data reduced to as little as 0.35% of its original size. About two hours of video can be recorded on to each MO disc. Video sequences recorded on to magneto optical disc in *ESCaPE* file format can then be edited using *Optima*, which is a Risc OS-resident digital video editing system.

Optima mimics the usual analogue video editing environment where this is desirable; two video windows represent a pair of monitors, still frames can be viewed and there are jog/shuttle buttons to pinpoint exact frames. Video time code information from the original source tapes is preserved and *Optima* can compile an edit schedule list of edit points for later use when editing the final programme online.

It's still early days for non-linear editing systems, but one day non-linear will dominate and, although just the editing software costs £1500, *Optima* is still one of the cheapest and most flexible non-linear systems.

Random Distribution distributes *Compressor* and *Optima* for Eidos and over twenty A540-based *Optima* systems have been shipped to date. Both the BBC and Carlton TV in London use *Optima* systems. Programmes using the system include Channel 4's *Dispatches*, BBC's *Watchdog*, plus a number of programmes from independent producers.

For more details of the professional system contact Random Distribution, 9-15 Oxford Street, London W1, tel: 071-287 3230.



called *Compressor*. At the same time, Eidos developed its digital movie editing system called *Optima*. This is now used by an increasing number of professional video editing companies and is an outstanding example of the power of Risc OS.

Acorn's Replay

With Replay, Acorn was one of the first to allow full motion video to be integrated into desktop software, like *Genesis* and *Magpie* and multimedia CD-Rom publications. *Replay* on the Archimedes was hailed because it needed no expensive additional hardware to decompress and display digitised movie files in real time and at acceptable speed.

Replay is capable of good quality movie playback in a Risc OS window, with stereo sound at 12.5 frames per second (FPS), and as high as 25FPS with high-end machines like the A5000, A540 or even the powerful A4 notebook.

Getting your video into a *Replay* ArmMovie file, however, isn't so easy. Instead of choosing an established industry standard like JPEG (Joint Photographic Expert Group) which would have been too slow, Roger Wilson opted to invent a proprietary compressed digital movie file format, Moving Lines. This format is optimised for real-time software-based decompression and playback but is strictly asymmetrical. In other words it takes much longer to digitise and compress video frames in the first place than decompress and display them afterwards.



The Optima system, running on an A540 with two magneto-optical drives

It takes five seconds to compress a single frame using Moving Lines, so a one minute sequence would take over an hour to compress. This is compounded, as a huge uncompressed movie file has to be created by the video digitising process prior to compression. For a minute of uncompressed digital video we're talking around 20Mb of data which reduces to 4-5Mb after compression.

Acorn has already released a low-cost *Replay* movie mastering system called *Replay DIY*. This includes a version of *Replay*'s Moving Lines compressor and the Irlam video digitiser card. Uniqueway's *Empire* can also edit *Replay* movies. The problem is that the uncompressed data is so bulky that the system is effective but limited to those who can afford a large enough hard drive (and are willing to wait an hour for every minute of video to be processed.)

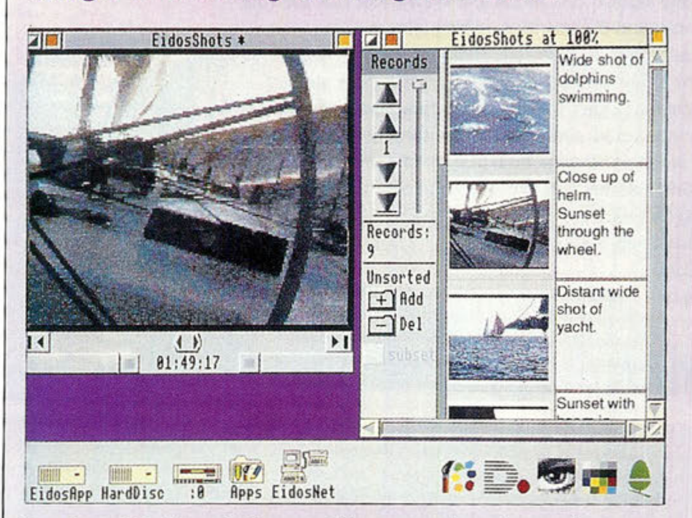
It has been argued that this drawback has limited *Replay*'s appeal at the creative end. Everybody loves to watch *Replay* movies but far fewer are willing to go to the trouble of making them.

Over a year ago Eidos realised it had a solution to the lengthy *Replay* movie-making process. Eidos set to work on producing an alternative, quicker, digital movie source. This was to be played back by *Replay*-compatible applications using the *ESCaPE* (Eidos Software Compression and Playback Engine) decompressor.

ESCaPE

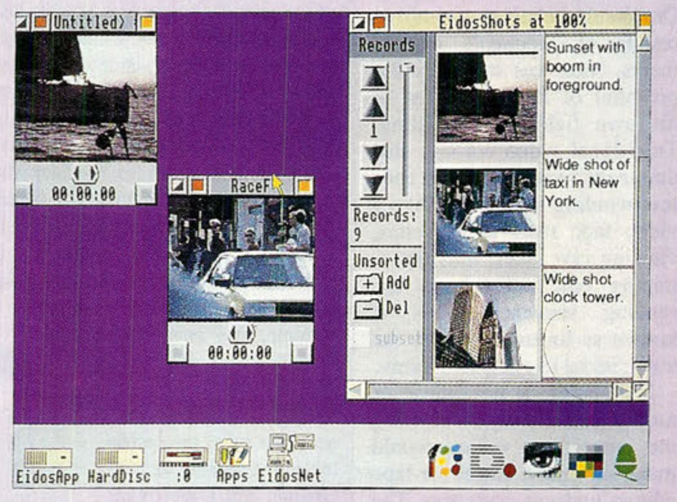
Unlike the professional Eidos *Compressor*, which required a special digitiser board and an expanded Acorn A540 workstation, the cutdown version (to be called *ESCaPE*) is designed to run on a standard 4Mb Archimedes, though Arm3-level processing power is required. An A5000 would be ideal, though an A300 or 400 series machine with an Arm3 upgrade will probably do. *ESCaPE* is designed to

Stage 1: Viewing the original video



To edit an *ESCaPE* movie, first use *Eidoscope* to view what you have digitally recorded in one or more *ESCaPE* files from your original video. These are the takes – 'rushes' as they are known. In this example, Iota's *DataPower* database is used to log stills with short descriptions. The stills can be clicked and dragged directly from the *Eidoscope* video window. *ESCaPE* file pointer information is also recorded separately. Eidos is working on making this an all-in-one operation.

Stage 2: Deciding on a sequence



Next you have to sort through your shots and decide on a sequence of events for your final programme. Once again, *DataPower* is used to load back into *Eidoscope* the *ESCaPE* file pointer information, linked to the still, and representing the scene you want to insert. A pair of small *Eidoscope* viewing windows are used in this example. At the end of this stage you will have a sequence of shots which will require tidying up and, probably, audio dubbing.

work with the Irlam digitiser card supplied by Acorn in the *Replay DIY* kit.

To start with, *ESCaPE* will only offer a frame rate of 12.5fps compared to the full 25fps *Compressor* is capable of. It's possible Eidos will offer software upgrades at a later date to boost *ESCaPE* 's performance to 25FPS, though this is largely dependent on hardware. A faster, next-generation Archimedes could be the spur the company needs.

Nick Davies speaks of compressed *ESCaPE* movie file sizes in the region of 40 seconds playback per megabyte of data: 1.5Mb per minute compared with a *Replay* file of 4-5Mb per minute.

This isn't the whole story as, despite Nick's feeling that *Replay* and *ESCaPE* playback quality is 'comparable', *Replay* maintains a detectable edge in crispness and clarity, with less-obvious pixelation. Nevertheless, *Replay* can't do things like running nearly a minute of video off a 1.6Mb floppy disc.

Eidoscope

Eidoscope is the second weapon in the Eidos armoury: it is a junior version of the *Optima* movie editing application. *Optima* was developed to let professional video editors see how their edits would appear in rough – the final programme being edited from the original video recordings online.

Eidoscope is no longer a previewer like *Optima* was. Its main purpose is to edit the actual video files which will make up an *ESCaPE* programme. Most of *Optima*'s formidable array of editing features have been retained in *Eidoscope*. The main exceptions are that only two audio channels are supported instead of *Optima*'s four and there is no support for time-coding, which is largely unused in sub-professional video anyway.

At first glance there is little difference between an *Eidoscope* and *Optima* screen. Two video monitor windows, each taking up about a fifth of the screen, dominate the view. Both windows have play, pause, jog and fast forward buttons. It is possible to jump to a particular frame if you know where in time it exists in the sequence. Time-coding may not be supported, but a time-base is still provided.

Eidoscope, like *Optima*, benefits from a frame-access technique which uses buffering to enable virtually instant access, even if the source drive is slow. This means a sequence can be pieced together and played back seamlessly without creating a new file. After you've fiddled with your programme to get it just right, a brand new composite programme file can be saved.

Underneath the monitor windows is a time line editing window. This is a multi-track sound and vision sequencer where you can insert start and end points of video clips you've just viewed. Once a clip is on the sequencer, you can drag its limits to extend or shorten the sequence. A comprehensive selection of dissolves, wipes and other special effects, like picture in picture animations, is featured too.

Audio functions are just as impressive. It's possible to hear the audio attached to an individual frame and step through listening one frame at a time. Accurately-synchronised sound edits are incredibly easy and each soundtrack level can be altered or faded independently.

Eidoscope is also a model Risc OS application. Practically everything on the screen can be dragged and dropped. Other Risc OS applications integrate beautifully with *Eidoscope*, and software packages like Iota's *DataPower* database and the standard *Draw*, *Paint* and *Edit* applications are actively recommended to *Optima* users.

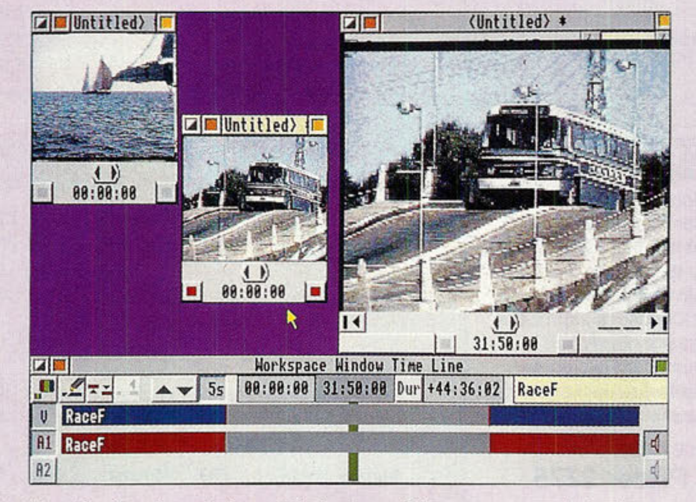
Conclusion

There is no doubt that Eidos has exciting multimedia solutions in *ESCaPE* and *Eidoscope*. *ESCaPE* should encourage a lot more Archimedes users to have a go at making movies. No other personal computer platform has anything to match in terms of convenience and sheer usability. Those movies will be playable via *Replay*-aware applications using an *ESCaPE* decompressor, so we should see lots of new, personalised, *Genesis*, *Magpie* style multimedia 'books' as a result. *Eidoscope* is a dream editor and I expect some really snazzy *ESCaPE* movies will be created using it.

Eidos expects its *ESCaPE* compressor for the Acorn DIY card will be priced well under £100. *Eidoscope* is expected to cost under £200. This makes *Eidoscope* a fair bit more expensive than Uniqueway's *Empire* editor, but the extra cost is more than justified.

My only hesitation about the whole thing is that the playback picture quality of *ESCaPE* needs improving slightly to match *Replay*, but Eidos says it is addressing this. Other than that, Eidos is onto a surefire winner. Contact Eidos on 081-9417899.

Stage 3: Assembling the sequences



Now the time line window at the bottom of the screen comes into play. This shows where the currently-selected video sequence fits into the overall running sequence of the movie you are editing. The start and end points of each scene can be dragged forwards or backwards in time. Here three *Eidoscope* windows are shown, two small and one large, and it is possible to cut and paste from one window to any other. You can view edits instantly and make as many alterations as you like.

Stage 4: Adding special effects

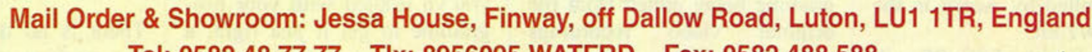


Finally, the time line shows the running sequence you have settled on. Audio dubbing has been completed as shown on the two audio time line sequences below. At this stage you can introduce special effects from a special button menu. Here, a diagonal wipe from one scene to another is shown. Once again you can view any edits and effects and change them instantly, or even view the whole programme, before finally choosing to save a brand-new composite *ESCaPE* programme file.

Watford Electronics Ltd

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A3020-2Mb FD	–	£749	£799
A3020-2Mb HD60	–	£899	£949
A4000-2Mb HD80	–	£949	£999
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A5000-4Mb HD120	–	–	£1599
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If you need a 256 grey-scale hand scanner for your Archimedes then look no further.
Scan256 gives you up to 256 levels of grey at a maximum of 400dpi and is supported by state-of-the-art sophisticated software – **for only £159.** This makes it the only sensible scanning and image processing solution for the Acorn 32-bit range. Just compare these features:

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Please specify Archimedes type, not compatible with A3010, A3020, A4000. **£159**

- Scan256 for A3000 Micro £169

A3010 DTP Pack

Supplied with 3.5" Floppy Disc Drive and a mouse, Colour Monitor and lead, TV modulator, 30Mb fast IDE Hard Disk Drive, 'Compression' utility to increase the Hard Drive capacity to typically 60Mb, the highly acclaimed Computer Concept's Impression Junior DTP package, EasiWord wordprocessor, Quest for Gold game, applications suite of software packages and comprehensive audio training tape.

RRP: £1095

Sale Offer Price: £775

- A3010 DTP Pack with Learning Curve £875
- Additional 1Mb RAM fitted £39

Special Education discounts available on micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

0582 74 55 55

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Acorn Multimedia

- Multimedia Expansion £499
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Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

A300/A400 Internal IDE Drive

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£189
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ADA 0530	100Mb	16mS	£259
ADA 0570	200Mb	15mS	£369
ADA 0880	330Mb	15mS	£599

All above 3.5" Drives are supplied complete with Controller Card & cable for use with A300/A400/A500 series machines.

AAA 0300 External Case & PSU for A3000 £85
AEA 1060 Archi IDE Hard Disc Podule only £89

A5000 Internal IDE Drive

ADA 1030	80Mb	17mS	£189
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ADA 0950	200Mb	15mS	£275
ADA 0580	330Mb	15mS	£525

A5000 2nd Internal IDE Hard Drive

ADA 1040	80Mb	17mS	£195
ADA 0960	100Mb	16mS	£205
ADA 0970	200Mb	15mS	£285
ADA 1010	330Mb	15mS	£535

A3000 External IDE Drives

ADA 0780	44Mb	28mS	£254
ADA 1020	80Mb	17mS	£305
ADA 1050	100Mb	15mS	£324

Internal Hard Disc Drives for A3000/A3010

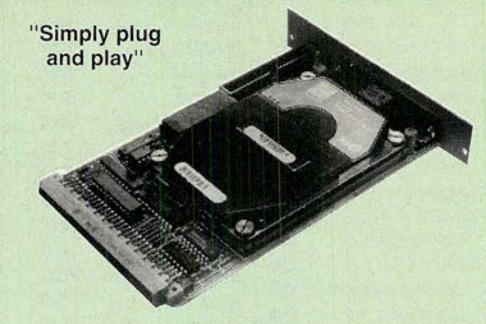
State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0770	30Mb	19mS	£185
ADA 0750	60MB	18MS	£259
ADA 0720	80Mb	18mS	£299
ADA 0730	120Mb	16mS	£395

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug and play"



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(All above Hard Cards can be used as Removable Hard Drives. Ideal for Military and Education use.)

Archi to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

- Risc OS 2 Version **£15** • Risc OS 3 Version **£16**

(P.S. For A3000 Serial Upgrade **(£19)** required)

A3000 Accessories

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- Serial Upgrade **£19**
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- A3000 External Podule Case **£15**

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The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. **£38**

Cortian CKAI Interface

Eliminates need to have a User port in A3000/305/310/400/540 when using Concept Keyboard. £28

Concept Keyboards

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Price £21

Back Plate Extension

- A300/400 £15; • A3000 £14

ARM 3 Turbo Card MkII

Simply The Best



Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £145. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £24.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Special Offer £125

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Leasing finance at very attractive rates now available to Businesses (subject to status), Schools, Colleges, Universities, Government Depts. and Local Councils.

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Archimedes Software

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Silicon Vision Archimedes Software

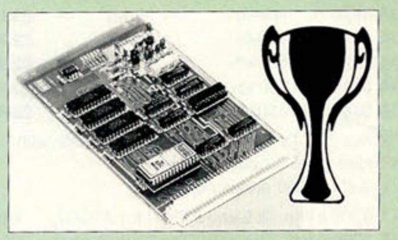
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SolidsRENDER	£65	SolidTOOLS	£169
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Over erasure of EPROMs very rapidly turns them into ROMs!
The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER GT** – Deluxe version erases up to 8 chips. Has automatic safety cut-off to switch off the UV lamp when opened. £36
- Spare UV tubes. £12

Archi Real-Time Digitiser



Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £75

A Set of Colour Filters for colour image grabbing using a video camera £16

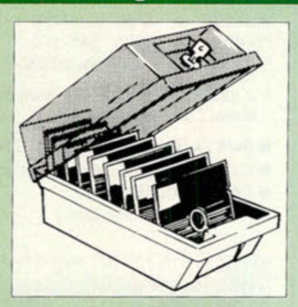
Vision Digitiser

Working in real time, the Vision Digitiser is available in either monochrome or colour versions with a software upgrade to colour. Create high quality images simply by connecting the digitiser to a PAL video source, such as a camcorder, video or digital camera. Includes powerful RISC OS software.

Mono Vision Digitiser £44.00

Colour Vision Digitiser £74.00

Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs £4.95
- **M85** – holds up to 95 5.25" discs £6.95
- **M25*** – holds up to 25 3.5" discs £4.95
- **M50** – holds 50 3.5" discs £6.50
- **M100** – holds 100 3.5" discs £6.99
- **M10** – holds 8 of No. 10 Data Cartridges £15

* Not lockable

Disc Plonker Rack



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs. £2

3M – Diskettes

Lifetime warranty on 3M Discs

- *10 x 5.25" S/S D/D 40T (744)* £5
- *10 x 5.25" D/S D/D 40T (745)* £5
- *10 x 5.25" S/S D/D 80 Track (746)* £6
- *10 x 5.25" D/S D/D 80 Track (747)* £7
- *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT* £8
- *10 x 3.5" S/S D/D 40/80 Track* £6
- *10 x 3.5" D/S D/D 40/80 Track* £6
- *10 x 3.5" Double Sided High Density* £10

Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

- *10 x **M3** 3.5" D/S D/D 80 Track* £6
- *10 x **M9** 3.5" D/S High Density* £10
- *10 x **M4** 5.25" S/S D/D 40 Track* £5
- *10 x **M5** 5.25" D/S D/D 40 Track* £5
- *10 x **M7** 5.25" D/S D/D 80 Track* £6
- *10 x **M8** 5.25" D/S H/D Hi-Density* £9

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
Without Sleeves 5.25"	£25	£30	£35
With Sleeves 5.25"	£28	£33	£38
3.5" D/S D/D	£21 for 50		£39 for 100
3.5" D/S H/D	£40 for 50		£75 for 100

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable Single **£4** Twin **£6**

3.5" Disc Drive

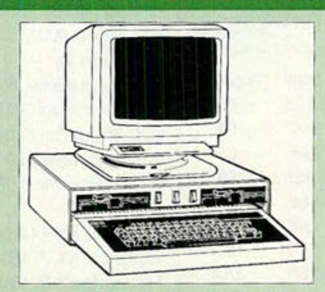


These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
CLS35:	Single Disc Drive, 400K	£59
CLD35:	Twin Disc Drives, 800K	£109
	Disc Drive with PSU	
CS35:	Single Disc Drive, 400K	£82
CD35:	Twin Disc Drives, 800K	£126

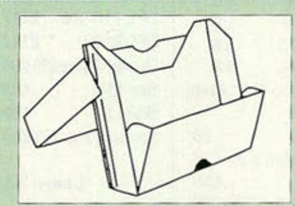
(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



- **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use. **£150**
- **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5". **£145**

Plastic Library Cases



- **DLC1** – Holds 5 x 3.5" Discs. £1.50
- **DLC2** – Holds 10 x 3.5" Discs. £1.90
- **DLC3** – Holds 5 x 5.25" Discs. £1.60
- **DLC4** – Holds 10 x 5.25" Discs. £2.00

Disc Albums

Attractively finished in leather-look PVC Vinyl

- **DW1** – Holds 6 x 3.5" Discs £2.50
- **DW2** – Holds 6 x 5.25" Discs £3.00
- **DW3** – Holds 20 x 5.25" Discs £3.50
- **DW4** – Holds 40 x 3.5" Discs or 5.25" Discs £4.50

Cleaning Kits

- 5.25" Disc Cleaning Kit £4
- 3.5" Disc Cleaning Kit £4
- PC Cleaning Kit £7
- Professional PC Cleaning Kit £12
- Aerosol Dust Spray Can £3
- Servisol Foam Cleaner Can £3
- Antistatic Aerosol Spray £3

Acorn & Watford DFSs

- Watford sophisticated DFS ROM £16.00
- Watford DFS Kit complete £49.00
- DFS Manual (comprehensive) £6.95
- Acorn DNFS ROM £17.00
- Acorn ADFS ROM only £25.00
- Acorn 1772 DFS ROM Kit £49.00
- Acorn DFS Kit complete £48

Watford's MkII 1772

Single/Double Density DFS

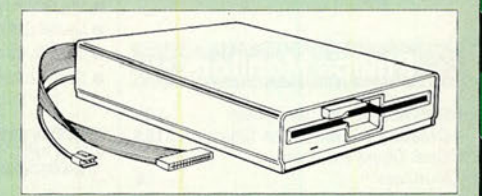
Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

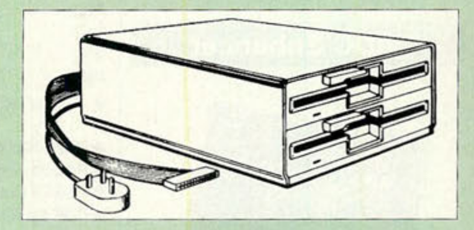
- Complete Kit — Special Price **£44**
- DDFS Manual — (No VAT) **£6.95**

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. *(Turn to the 6th page of our advert for the Plinths).*
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
CLS400S:	Single, 40/80 track 400K Double sided Drive	£75
CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£138
	Disc Drive with PSU	
CS400S:	Single, 40/80 track, 400K Double sided Drive	£85
CD800S:	Twin, 40/80 track, 800K Double sided Drives	£149

Credit Card Hotline: 0582 74 55 55

Continued→ → → → → → → → →

Microvitec Monitors

- **1431** – Standard Resolution #£175
- **1451** – Medium Resolution #£215
- **Cub3000** Medium Res for A3000 #£195
- Dust Cover for Microvitecs £5.50
- **Touchtec 501 Touch Screen** £239

3 years parts & labour warranty

Multiscan Monitors

Eizo T240i	£483	Panasonic C1381	£199
Eizo F340i-W	£625	C1381LR	£270
Eizo F550i-W	£899	Taxan 787	£215
Eizo T560iT	£1345	Taxan 787LR	£239
Eizo F560i-W	£1195	Taxan 789LR	£289
Eizo T660i-T20"	£1899	Taxan 795-PC	£465
NEC 2A-N	£274	Taxan 875+ LR	£739
NEC 3FG	£360	Taxan1150	£1699
NEC 4FGe	£517	Taxan 1095LR-20"	£1699
NEC 5FG	£877		
NEC 6FG	£1739		

Panasonic monitors carry 2 years on-site maintenance warranty

Aries AlphaScan Monitor

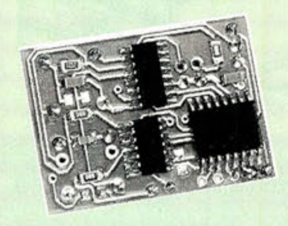
Its multiscan circuitry provides automatic adjustment for frequencies between 31 and 56KHz horizontal, and 43 and 70Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The VIDC Adaptor supplied with the monitor allows high resolution operation in all screen modes. **£299**

- Aries Alphascan 17" Plus £585

Philips Monitors

- **BM7502** 12" Hi-res Green £88
- **CM8833** 14" Med. Res Colour £195
- Dust Cover for Philips Monitors £6
- Spare Monitor Leads (various) £7

VIDC Enhancer



Our two unique VIDC add-on boards for the Archimedes cater for all VGA and Multiscan monitors and screen modes. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£35**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£19**

Printer Leads

- BBC Centronics 4' £5; 6' £6
- Archi Parallel 2m £5; 5m £9; 10m £13
- PC Parallel 2m £5; 5m £9; 10m £13
- 25 pin D Male/Male 2m £5; 5m £10
- Centronics Double Ended 4' £5; 6' £6; 5m £10; 10m £14
- RS232 Leads Various £POA

Integrex Ink Jet Printers

- Paper Roll for Integrex 132 £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £23
- Black Cartridge £14
- 100 A4 OHP transparencies £55
- Colour Jet 2000 £599
- Betajet Ink Jet Printer £185
- Betajet Cut Sheet Feeder £43
- Integrex Colourjet Series 2 £335
- Auto Sheet Feeder for Series 2 £45

Star Printers

	Printer	CSF	Ribbon
LC15	£190	£135	£5
LC20	£102	£60	£4
LC100C	£126	£65	£9
LC24-15	£245	£135	£5
LC24-100	£143	£69	£5
LC24-20 Mk2	£175	£65	£5
LC24-200C	£214	£65	£12
LC200 C	£151	£65	£12
Star Jet	£169	£43	£16
XB24-200C	£324#	£80	£12
XB24-250C	£389#	£139	£12
ZA-200C	£260#	£89	£12
ZA-250C	£324#	£139	£12

Includes 12 months on-site warranty

- Black Ribbons for Colour Printers £5
- Serial 8K I'face LC10/15/24/200 £52
- 32K Buffer LC/XB24-10; 15; 200 £52
- Star/Archi Colour Printer Driver £15

NEC Pinwriter Printers

	Printer	CSF	Ribbon
P22Q	£181	£59	£6
P32	£235	£59	£6
P62	£320	£89	£8
P72	£395	£115	£8
P90	£577	£115	£8

- Jetmate J400 £169; • Jetmate J800 £249
- Black Ribbons P20; P32 £6
- Ribbons P60/70/P90 Black £8; Colr £14
- P60/70 Colour Option Kit £59
- CSF for P20 £59; P60 £89; P70 £89

Panasonic Printers

	Printer	CSF	Ribbon
KX-P1123	£126	£59	£6
KX-P1170	£98	£59	£6
KX-P1624	£264	£126	£8
KX-P1654	£330#	£126	£8
KX-P1695	£267	£126	£8
KX-P2123M	£144	£79	£8
KX-P2124	£215	£89	£8
KX-P2180M	£126	£79	£8
KX-P2624	£269#	£126	£8
KX-P2023	£POA		

Includes 12 months on-site warranty

- Dustcover for 80 column printers £6
- Serial Interface for above Printers £46
- Black Ribbons for P1081, 1180, 1124 £6
- Brown, Blue or Red Ribbons for KX-P1081/1592/1595/1695 £9 each
- 32K Buffer for above Printers £16

Colour Kit for KX-P2180; KX-P2123 and KX-P2124 £49

Laser Printers

All Laser printers (excluding HP Lasers) include 12 Months On-Site maintenance

Brother HL4-PS Postscript	4ppm	£974
Brother HL6 – NEW –	6ppm	£469
Brother HL10-PS	10ppm	£1329
Brother HL10-DV	10ppm	£1149
Brother HL10-DPS	10ppm	£1445
Canon LBP4 LITE	4ppm	£525
Canon LBP4+ 1.5M RAM	4ppm	£644
Canon LBP-8 Plus IIIR	8ppm	£1435
Canon LBP-8 IV 600DPI	8ppm	£989
Epson EPL-5000	6ppm	£472
Epson EPL-5200 – NEW –	6ppm	£565
Epson EPL-7500 PS	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM600	5ppm	£539
Fujitsu VM800 (Best Buy)	8ppm	£535
Fujitsu VM600E	5ppm	£POA
HP Laserjet IIISI	16ppm	£POA
HP Laserjet IIISI PS	16ppm	£2469
HP Laserjet 4	8ppm	£1073
HP Laserjet 4L – NEW –	4ppm	£499
HP Laserjet 4M PS	8ppm	£1449
HP Laserjet 4si		£2260
HP Laserjet 4Si MX 1200 DPI	16ppm	£3385
NEC Silentwriter S62P PS	6ppm	£995
NEC Silentwriter S102	6ppm	£1075
NEC Silentwriter2 290		£1194
NEC Silentwriter 290P PS	8ppm	£1469
OKI OL400E	4ppm	£449
Panasonic KX-P4410	5ppm*	£459
Panasonic KX-P4430	5ppm*	£594
Panasonic KX-P4451	11ppm*	£919
Panasonic KX-P4455	11ppm*	£1294
Star LP-4 Post Script	4ppm	£774
Star LS-5	5ppm	£499
Star LS-5 EX (RISC Based)	5ppm	£625
Star LS-5 TT True Type+Mac	5ppm	£775
Star LP-8 Star (post)script	8ppm	£1130

*2 years on-site warranty

HP Laserjet IIIP 3 years on-site	£150
HP Laserjet IIISi 3 years on-site	£450
HP Laserjet 4/4M 3 years on-site	£170

Laser Toners

Canon 2, 3 & 4	£52	KX-P4420/50/55	£20
Canon LBP8-IV	£75	KX-P4410/30	£29
Epson GQ	£12	NEC SWriter	£84
EPL 40/41/4300	£55	HPII/D, III/D	£60
EPL 71/7500	£117	HP IIP, IIIP	£54
EPL 8100	£117	HP4/4M	£72
Qume Crystal(3)	£84	Laserjet 4L	£65
Star LP4	£52	OKI OL400/800	£18
Star LS5	£69	VM800 8K pages	£99
Canon 8/Star LP8	£59		

Laser RAM Upgrades

Type	1M	2M	4M	
IIP; IIIP	£49	£80	£132	
II & IID	£60	£96	£142	
LJ4/4M	£–	£75	£175	8M/£279
EPL4100	–	£120	–	512K/£52
KX4420/50i	£59	£89	£149	
NEC S62/S102	£99	£180	–	
Star LBP	£139	£275	–	

Jetpage Postscript Cartridge

- HP IIP/IIIP £225 • IID & III £227

Various Add-Ons

- Laserjet Appletalk Interface £135
- HP Adobe Postscript+ Cartridge £359
- Pacific Page Postscript £259
- HP Premier Font Collection £28
- Laserjet Various Font C'tridges from £45
- HP Postscript Module for LJ4 £270
- Laserjet 4 Powered envelope feeder £199
- Jetdirect Ethernet Card for Laserjet IIIsi/4/4Si £359
- 500 Sheet paper cassette (3rd Bin) £205
- HPIIP/IIIP Lower Cassette Tray £96
- Canon LBP-4 Lower Cassette Tray £96

Citizen Printers

120D+	£98	Swift 90C	£198
Swift 9X	£185	Swift 200	£178
PN-48	£189	Swift 240	£200
Swift 90	£139	Swift 240C	£212

2 years parts and labour warranty on all above Citizen Printers.

- Swift 24 Ribbons: Black £4 Colour £13
- Cut Sheet Feeder for 80 col. printers £75
- Citizen 120D Ribbons £3.50
- Archi Colour Printer Driver £15

Hewlett-Packard Printers

DJ500 colour	£355	Desk Jet 510	£245
DJ 550 Colour	£459	Desk Jet 1200C	£1045
DJ Portable	£199	Deskwriter 550C	£459
Deskwriter 500C	£349	PaintJet XL300+	£1765
Quiet Jet plus	£299	PaintJet XL300PS	£2620

+ Includes 12 months on-site warranty

3 years on-site maintenance available as follows:

DeskJet & DeskWriter mono	£55
DeskJet & DeskWriter colour	£65

- Paintjet Cartridge Black £15; Colour £23
- DJ Portable CSF £49; Carrying Case £49

Special Offer

When you purchase any Hewlett Packard printer from us, you qualify for the following software offers:

- Adobe Type Manager v2 £45
- Designworks Software pack at £39
- Lotus Organiser Software at £39

Desk Jet 500 Accessories

- Ink Cartridges Black £16; Colour £23
- High Capacity Ink Cartridges Black £21
- **Ink Refill Double Pack (JetFill) £10**
- **Ink Refill High Capacity (JetFill) £16**
- **Deskjet Turbo Driver £39**
- Archi – DJ550 Colour Printer Driver £15
- Epson FX Emulation Cart.(500 mono) £45
- IBM Proprinter Emulation Cartridge £59
- Wordperfect Cartridge £89
- DJ 500 Dust Covers £6
- 636G 50 x Transparencies A4 £40
- 636J 50 x Glossy Paper A4 (also XL) £40
- 630Z 50 x Cut Sheet Paper A4 £15

Plug In Font Cartridges for DJ 500

22706B - Prestige, Elite, Line Draw	£55
22706C - Letter Gothic & HP Line Draw	£56
22707P - Proprint Emulation Cartridges	£57

HP Paintjet/XL Accessories

- 630P 200 Z-Fold paper 8.5 x 11 £14
- 630Q 50 Transparencies 8.5 x 11 £39
- 630S 50 Transparencies A4 £40
- 630Y 200 Cut Sheets 8.5 x 11 £14
- 631Y 200 Cut Sheets A4 £18

Fujitsu Printers

- B-100 InkJet – HP Deskjet compatible 300dpi, whisper-quiet & 6 resident fonts #£159
- B-200 InkJet – HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available #£239
- DL-1150 Dot Matrix – 24 pin, 110 column Colour optional £209
- DL-1150colour Dot Matrix – 24 pin, 110 column With colour option £235
- DL1250 £309; • DL4600 £799
- DL3600 £439; • DL5800 £999
- Joywriter £249; • DL1250 colr £344
- B-100 Cut Sheet Feeder £49
- B-200 2nd Bin Sheet Feeder £95
- B-200 Tractor Unit £65
- B-100/200 Ink Cartridges £14
- DL-1100 Colour Upgrade £39
- DL-1100 Ribbons Black £5 Colour £11

Epson Printers

	Printer	CSF	Ribbon
EX1000C	£428	£–	£6
FX870	£273	£47	£4
FX1170	£339	£69	£6
LQ100	£148	£–	£4
LQ570+	£205	£47	£4
LQ870	£359	£47	£6
LQ1060	£585	£155	£6
LQ1070	£310	£69	£6
LQ1170	£434	£69	£6
LQ2550	£673	£360	£6
LX100	£116	£–	£4
LX400	£94	£69	£4
LX850+	£135	£69	£4
LX1050	£203	£125	£6
SQ870	£409	£59	£23
SQ1170	£560	£155	£23
SQ2550	£669	£–	£23
Stylus 800	£244	£–	£10

Epson RS232 Interface
Standard **£28;** +8K Buffer £75
- LQ100 Tractor Feed £29
- FX850/LQ800/850 Tractor Feed £69
- FX/LQ1050 Tractor Feed £85
- LQ2500/2550 Tractor Feed £90
- Dustcovers for 80 col printers £6

Canon Bubblejet Printers

	Printer	CSF	2nd Bin	Ink Cart
BJ10EX	£156	£43	–	£16
BJ10SX	£169	£43	–	£16
BJ200	£249	–	–	£16
BJ230	£299	–	–	£16
BJ300*	£319	£88	£88	£12
BJ330*	£369	£110	£79	£12
BJC800C	£1299	–	–	£16

- **BJ10EX/SX Jumbo Ink Refill pack (twice cartridge volume)** £12
- Optional Battery pack for BJ10EX/SX £33

* includes 12 months on site warranty

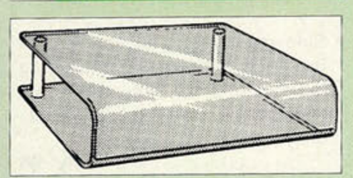
Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £16
132 Column version £25

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version £14
136 Column version £18





AMERICAN EXPRESS

24-Hour Credit Card Order Line (0923) 233383 or 250234

Universal Printer Sharers

Connect up to 4 Micros to 1 printer or 4 Printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Sharers

Connects	Serial	Parallel
● 2 to 1	£10	£10
● 3 to 1	£14	£15
● 4 to 1	£19	£20

Professional Sharer Units

Connects	Serial	Parallel
● 2 to 1	£15	£16
● 3 to 1	£20	£23
● 4 to 1	£30	£34

Auto Printer Sharer Switch

Connects	Serial	Centronics
● 2 to 1	£34	£36
● 4 to 1	£52	£53
● 8 to 1	–	£85

256K Multi Spooler

These Parallel Auto printer sharer switches have built-in 256K Buffer.
- 2 In / 2 out **£125** ● 4 In / 2 out **£139**
- 8 In / 1 out **£185**

(Cables for all printer switches are from £5 each please specify the type required when ordering.)

Compact Converter Unit

Serial to Parallel & Parallel to Serial **£32**

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold £7
- 2,000 Sheets 9.5" x 11" Fanfold £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold £21
- 1,000 Sheets 15" x 11" Fanfold £9
- 2,000 Sheets 15" x 11" Fanfold £16
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £21
- 500 Sheets A4 80gms Bond £3.50

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	–	£6.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.25	£6.00
EX800/1000	£6.00	£6.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£6.00	£6.00
LQ400/500/550/800/850	£5.50	£6.00
LQ1050/LQ2500	£12.00	£6.00
LX400/800/850	£3.50	£6.00
M1009/GLP	£2.95	£6.00
NEC P2200	£4.50	£6.00

Dust covers for most 80 column printers available at £6 each

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

3750 – 70 x 29mm (3 Rows x 10)	£15.50
2400 – 70 x 37mm (3 Rows x 8)	£15.25

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- 1,000 Sheets 9.5" x 11" Fanfold £7
- 2,000 Sheets 9.5" x 11" Fanfold £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part £21
- 1,000 Sheets 15" x 11" Fanfold £9
- 2,000 Sheets 15" x 11" Fanfold £16
- 1,000 Sheets true A4 Fanfold 70gms £11
- 2,000 A4 Fanfold Paper £19
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Psion Series III Computer
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- 128K £68
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- 1Mb £255

Flash Solid State Disc (SSD)
- 128K £34
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- 512K £102
- 1Mb £170
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Communications
- Parallel Interface Link £25
- RS 232 Serial Link for PC £58
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- Mains Adaptor 9V AC £12
- Spreadsheet £59
- Professional Finance £42
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Delta 3B Single Joystick £10
Delta 3B Twin Joysticks £15
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Delta-Cat A mouse eliminator Joystick for the Archimedes £24
Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128 £25

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Features:
- Direct connection to BBC Analogue input port –
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Price: £15

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Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

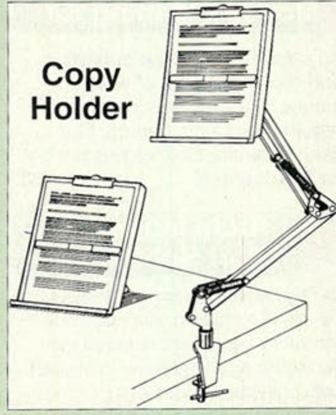
Plotters

- DXY1100 £650 ● DXY1200 £835
- DXY1300 £1049 ● Sketchmate A4 £349
- Sketchmate A3 £495
- Roland Plotter Fibre Tip Pens £7.50
- HP7440AU £665 ● HP7475AU £899
- HP7570A £POA ● HP7575AU £2529

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- Double 490 x 310 x 210mm £27
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive £15



Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

- Desk Top **£8;** ● Angle Poise **£12**



Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

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Protection for only **£8.50**

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Continued→ → → → → →



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- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £59
- Quest Mouse III only £25
- Quest Paint Software only £23
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
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(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

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Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Mk III AMX MOUSE

- **AMX Mouse plus Super Art £39**

(Please specify for BBC, Master or Compact)

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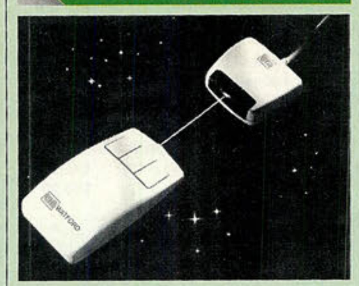
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

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Archi Cordless Mouse



Features
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Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £25
QT-20 Archimedes Version £26

Archi Mk II Hand Scanner

Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines. Images can be printed on any printer supported by RISC OS.
On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version £89
AHS-3 Archi A3000 Version £99

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Award winning Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Wapping Editor Software Pack £39
Wapping Editor plus Mouse £59

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out. £15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are two Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions. £12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). £13

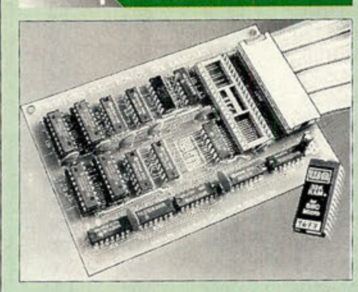
Archi A4 Scanner



The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures. Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

Archi A4 Scanner £199
Sheet Feeder for above £75
Scanner + Sheet Feeder £269

32K Shadow RAM/ Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

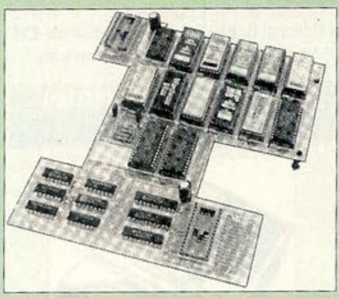
Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

Only £45

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32
Battery Backup fitted **£35**
Battery Backup only **£3**
16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer. **Only: £8**

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below). £14

Watford POWER DUCK £8

ROM/RAM Card



- No Soldering required to fit the board.
- Compatible with BBC B
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).

PRICES:

ROM/RAM card with 32k DRAM	£39
ROM/RAM card with 64k DRAM	£52
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OPTIONAL EXTRAS:

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16k DRAM for Upgrade	£13
Battery backup	£3
Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£99

ROM Cartridges for the BBC Master

Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

- Twin £9; • Quad £14

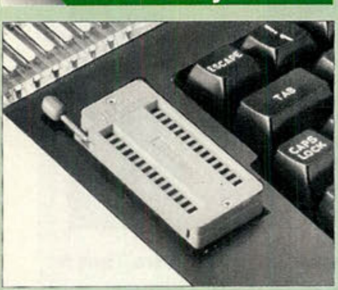




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Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs. **£18**

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

Special Offer £6

User Port Splitter Unit

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows you to connect two devices simultaneously to the BBC B & Master user port.

Excellent Value at **£22**

View Printer Driver ROM

View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

Assorted ROMS BBC B/Master

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ACORN BASIC 2 plus User Guide	£22
ACORN DNFS	£17
Acorn OS B+	£25
Acorn OS 1.2	£14
Beebmon	£22
Dump Out 3	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Numerator – Archi	£69
Numerator – BBC	£39
Pendown ROM	£32
SERIAL ULA	£13
TED	£15
Video ULA	£14
1Mb OS ROM	£39

View 3.0	£45	Viewsheet	£36
Viewstore	£36	Viewspell 80T	£25
InterBase	£49	InterChart	£25
InterSheet	£37	InterWord	£36
Mega-3 ROM	£76	Spell Master	£42
Wordwise Plus			£38#

Price includes a FREE Wordaid Rom

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

Spares for Archimedes

A3000 PSU	£49;	Disc Drive	£59
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I/O Controller			£39
ARM 2 CPU			£39
A400 Disc Drive			£59
Fan Filter			£6
A300/400 PSU	£89;	Keystrip	£5
A300/400 Keyboard			£120
A300 Disc Drive			£89

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW & WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus – Mastering	£13.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Reference Manual	£29.00
A5000 Technical Reference Manual	£–
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Archimedes Assembly Language	£14.95
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BBC B Micro User Guide	£15
Budget DTP on the Archimedes	£12.95
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C Programming Lang. 2nd Edition	£24.95
DISC FILING SYSTEM (DFS) Operating Manual for BBC	£5.95
DTP on the Archimedes	£12.95
Epson RX/FX Printer Commands Revealed	£5.95
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Impression – Dab Hand Guide	£14.95
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Example Programs on Disc for above	**£4.95**
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ACORN to PC

Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

Price: £6.95 (No VAT)

- Official orders accepted from government, educational establishments and PLCs.
- Shop Hours: 9am to 6pm, Monday to Saturday. Late night Thursday until 8pm. Free customer car park.
- Mail Order Inquiries: 9am to 6pm. Monday to Friday only
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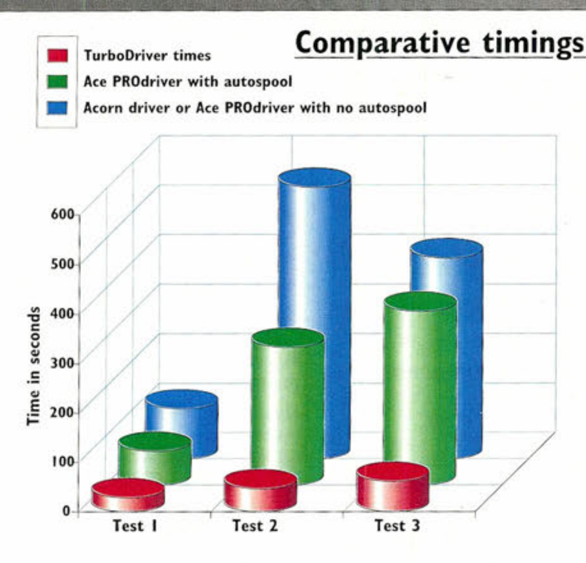
The range of TurboDrivers has expanded to include versions for the Hewlett-Packard DeskJet and LaserJet range of printers, as well as the Canon bubblejet range. The latest release 3 versions are now fully RISC OS 3.1 compliant, offer new advanced features and are faster than ever before.

The bottom line is that if you value your time, the TurboDrivers are for you - they can render pages and give control back typically at between three and ten times faster than Acorn printer drivers or Ace PRODrivers. Indeed once the image has been rendered then the printing continues entirely in the background - as fast as the printer will go. This makes a large difference for just one page and an enormous difference if you are printing more than one copy of each page.

FEATURES

- **Full 24-bit colour support for Canon BJC-800 and HP DeskJet colour printers.**
- **Three or four colour separations - even for mono printers.**
- **Extensive halftone screen control - different screen types, angles, screen density; features you would normally only find on expensive PostScript printers.**
- **Print from file entirely in the background.**
- **Fully RISC OS 3 compatible - works with !Printers and supports rotated text and sprite printing, multiple printers etc.**
- **By far the fastest printer drivers available for Acorn 32-bit computers - see chart.**





Test1 - A single DTP page of text and scanned graphic images
Test2 - Two copies of a three page text and graphic document
Test3 - A complex full page of graphics from ArtWorks.

The timings indicate the time in seconds to get control back. All tests performed on HP DeskJet 500 printer using a 4Mbyte A440 with an ARM3 fitted. Other machine combinations show similar performance gains.



Illustrated are a selection of printers supported by TurboDrivers. There is constant development in driver support so please contact Computer Concepts for details of latest printers.

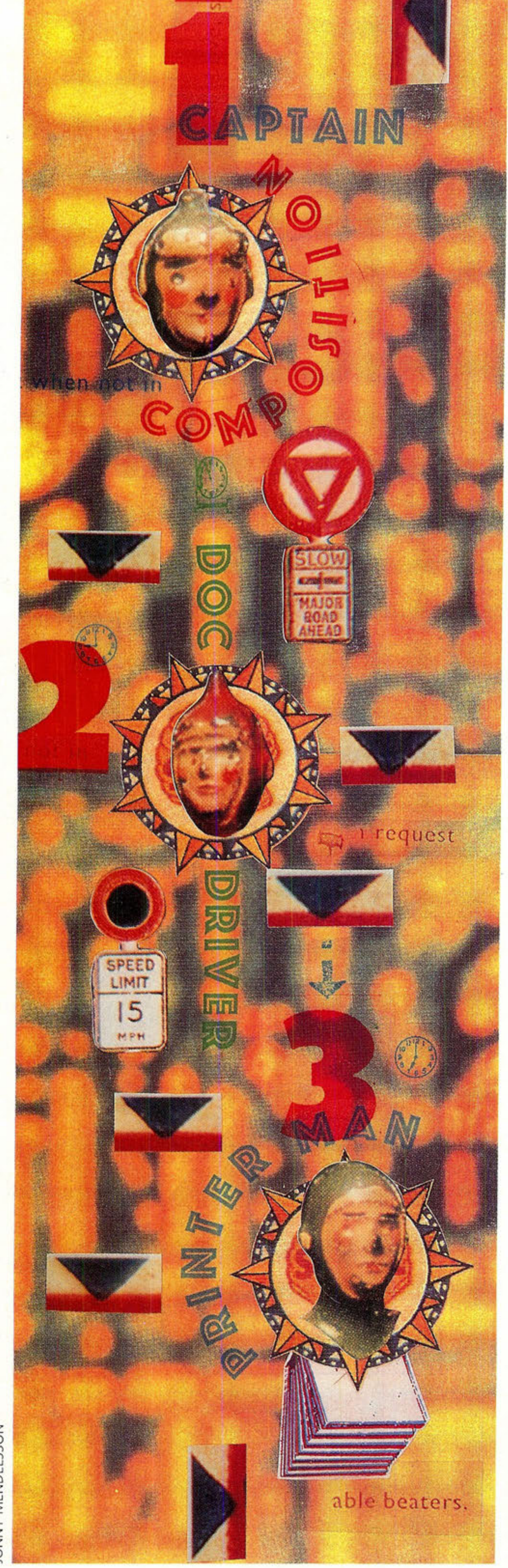
Canon TurboDrivers £49 + VAT (£57.57 incl.)
(supports all BJ-10, BJ-200, BJ-230, BJ-300 and BJC-800 printers)

HP TurboDrivers £49 + VAT (£57.57 incl.)
(Supports all monochrome and colour DeskJet and LaserJet printers)

Please specify printer type when ordering. The BJ-230 and all HP TurboDrivers are only suitable for RISC OS 3.1 machines. 2 MBytes required.



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JONNY MENDELSSON

Getting into print

Printers always seem to cause more headaches than any other hardware. Richard Garrett explains why

If the Questions and Answers mailbag is anything to go by, printers are a pain. Every week, letters arrive from readers who can't get printers to do what they should.

As it turns out, most of these problems are not the fault of particular programs or printers but occur when data is transferred between the two. This article will attempt to explain the printing process and show how it can be improved and, maybe, fixed.

Printer drivers

The big problem is that while printers all do the same thing, more or less, the commands that make them do it vary significantly between models. Sometimes one design becomes popular and the codes used to control it are emulated by other makers.

Thus, many printers can pretend to be an Epson FX-80, an IBM Proprinter or an HP Laserjet II. Initially this is fine. For example, back in the heyday of the BBC micro, having a printer that was 'Epson compatible' meant that every program would work correctly (in theory, at least).

But manufacturers began to add their own refinements and features, with the inevitable result that nothing stayed standard for very long. This means that to succeed in the mass market, all software packages must work with several different printers.

In modern systems this compatibility is achieved by using short programs or data files called printer drivers to tailor the program's output to specific printers. For some time, this meant that every program you ever bought contained a set of drivers for every printer you ever heard of but, with the unrelenting rise of the Wimp, the task of writing drivers has been taken over by the people who develop GUIs.

Nowadays, software houses write programs that will produce standard output and which are tailored toward one particular interface.

In Risc OS, printing has three stages. First, the application will transform data from its own internal format to standard desktop printer-speak. In DTP parlance, this process is called composition.

Then the composed data is passed to the Printer Manager (the *Printers* application on Risc OS 3, or *PrinterDM*, *PrinterPS* and suchlike on Risc OS 2) which refers to a printer definition file for your particular printer, and converts it into print codes acceptable to your printer. Finally, these codes will be fed into the printer as fast as possible and, with any luck, the document, or whatever, will appear.

Because high resolution images take up a lot of memory, Risc OS doesn't attempt to do the whole print job one stage at a time but cuts it into strips. When you print from an application, the three stages rotate. Each one does a strip, passing it on to the next



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Acorn Options

Acorn Educational Rental Programme

Information Technology plays an increasingly important role in education today, but with continuing advances in technology and product development, it can be very expensive trying to keep pace. For a school or college to provide students with contemporary IT systems, it constantly needs to seek funds to upgrade equipment. For some schools this is completely beyond their capital budgets. Recognising this, Acorn has introduced Acorn Options, a new rental scheme which can eliminate this problem and, at the same time, present many other real benefits.

NEW Canon ION Cameras & Accessories

Standard RC260 ION Camera Kit	£499.00
2" ION Floppy Disk	£5.25
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HCCS Colour Digitiser	£79.00
HCCS Hi-Vision Colour Digitiser	£129.00

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Canon BJ10Sx Monochrome Inkjet	£199.00
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NEW SCSI Internal Tape Stream Drives

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Hard Drive Backup Software	£49.00
Risc Developments A5000 2nd Drive Interface	£35.00

Arc RAM Upgrades

A540 4Mbyte	£249.00
A400 1Mbyte	£45.00
A300 1Mbyte	£105.00
A300 3Mbyte	£165.00
A3010 2Mbyte	£49.00
A5000 4Mbyte	£85.00
A5000 8Mbyte	£399.00
A3020/4000 4Mbyte	£75.00
A3010 4Mbyte Turbo	£129.00
A3020 4Mbyte Turbo	£129.00
A4000 4Mbyte Turbo	£129.00

SCSI Hard Drives

85Mbyte	£182.00
120Mbyte	£205.00
170Mbyte	£234.00
250Mbyte	£300.00
380Mbyte	£536.00
450Mbyte	£580.00
525Mbyte	£640.00
700Mbyte	£773.00
1050Mbyte	£949.00
1600Mbyte	£1299.00
2000Mbyte	£1799.00

IDE Hard Drives

40Mbyte	£125.00
85Mbyte	£170.00
120Mbyte	£187.00
170Mbyte	£205.00
210Mbyte	£269.00
245Mbyte	£314.00
340Mbyte	£365.00
450Mbyte	£425.00
525Mbyte	£620.00
800Mbyte	£985.00
1050Mbyte	£1186.00

Don't Forget...

Our Open Day on 17th July 1993

Acorn Computers

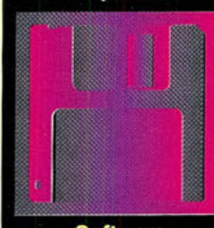
IBM Computers

SJ Research

Training

Computer Systems

Peripherals



Software

Customer Information

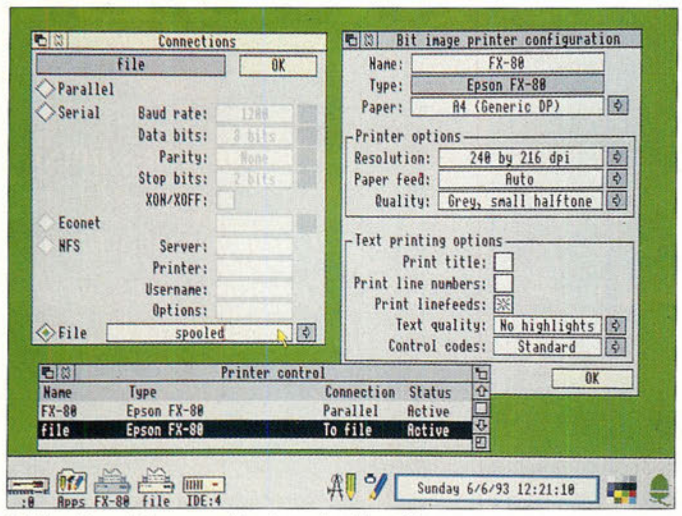
SCSI and IDE drives are sold as bare drives only. Housings, mounting kits, interface cards and cables are extra.
All SCSI devices (CDROM, tape/hard/optical drives) are for internal mounting. SCSI interfaces are extra.
Our range of SCSI housings are suitable for mounting a wide range of SCSI devices.
Products noted A5000 Internal mean they can be fitted to an A5000 as a second floppy drive replacement.
Our Turbo RAM upgrades will increase memory capacity as well as doubling the speed of your computer.
All the above prices are subject to currency fluctuations. Please telephone before placing your order.
The products listed above are from well known manufacturers such as Conner, Hewlett Packard, Cumana, etc.
Prices exclude VAT and carriage. Payment by Access, Visa, Cheque, Postal Order or Cash.

Opening Hours

Mondays
11:00am to 5:30pm

Tuesday to Friday
9:00am to 5:30pm

Saturdays
9:00am to 5:00pm



Setting the printer connection to output to a file

Product details

1. DRIVERS

● Computer Concepts makes Risc OS 3 printer drivers for Canon BJC800, BJ200 and BJ10 compatible inkjets, Hewlett-Packard DeskJets and the new Epson ESC/P2 printers (like the Stylus 800). These so-called *Turbo Drivers* spool the print output to memory or hard disc before sending it to the printer.

Risc OS 2 drivers for the Canons have been available for a while and Risc OS 3 versions have just been released. *Turbo Drivers* are bundled with printers or sold separately for £49. As part of the software protection, they are supplied with a special printer lead and won't work without one. Don't worry: CC will replace it if you break one. Computer Concepts is on (0442) 63933.

● Oak Solutions' *Pro Drivers* (formerly produced by Ace Computing) are designed for high-quality colour work with packages like *Artworks*. They use a 'tweaked' version of the Risc OS 3 Printer manager to provide 24-bit colour printing, colour separation, and automatic spooling to hard disc on Hewlett Packard, Epson ESC/P2 and Canon BJC800 colour inkjet printers. The price is £39.95 + VAT and postage. Oak Solutions and Ace Computing are on (0274) 620423.

● Risc Developments supplies standard Risc OS 3 drivers for Hewlett Packard's DeskJet 500c and 550c printers (£17.63 inc VAT) and a range of Risc OS 2 drivers for Star printers. The Star drivers will not be upgraded as the printers concerned are now supported by Acorn. Details from Risc Developments on (0727) 840303.

2. DIRECT LASER PRINTING.

Direct laser printing is a method of printing which is unique to the Archimedes. Three companies sell direct drive systems: Computer Concepts, Calligraph and HCCS. Direct drive printers are driven from the Archimedes by a special podule. Whereas normal lasers construct images in the printer's own Ram, the direct drive system uses the Arm to generate an image in the computer's memory which it sends straight to the laser. This gives a higher data throughput than you'd get on a conventional laser for the price: direct drive printing is very fast.

● Computer Concepts sells a range of laser printers called Laser Direct. These are Canon LPB4 and LPB8 mk3 units with a video interface installed alongside the usual serial and parallel sockets. The current driver software runs outside the Risc OS 3 Printer manager, but CC is working on an integrated version. The LBT4 is £1173.82 + VAT and the LBT8 is £1756.62 + VAT.

● HCCS makes a direct drive micro-podule for its Ultimate Expansion System. The card, which works with the Canon LPB4 and the Canon LPB4 Lite, is called Laser Express and costs £249 + VAT. Contact HCCS on 091-487 0760.

● Calligraph markets a range of direct drive systems under the title of ArcLaser. Calligraph is on (0223) 461143.

stage and then waiting until the printer is ready for more before starting the cycle again.

This produces the familiar experience of sitting in front of the computer for half an hour, secure in the knowledge that it won't let you use the desktop again until the last line comes out of your ageing dot-matrix printer. But it doesn't have to be like that...

Background printing

Of the three stages, the most time-consuming is generally the last, that of sending codes to the printer. Most printers have very little memory of their own and can only take so much input before they have to go off and print it, making room for the next chunk.

While the printer is busy bashing, burning or squirting ink into the paper, the computer itself is doing very little. It just sits around, idly waiting to send more codes.

This last stage is so simple that, in Risc OS, it is designed to run as an interrupt routine. If you isolate it from the first two data conversion steps, the physical printing process can carry on, in the background, freeing the desktop for your use. Sounds great, doesn't it – but background printing is not generally available, even with the latest operating system. So we have to use another method to speed up printing.

This process of separating this last stage is called spooling, which means writing print codes to a file on disc or in Ram instead of sending them to the printer. To do this, you just select File in the configuration option of the printer manager and then you specify a filename.

When you print from an application, the print codes are spooled to that file. Once all the data conversion has been done, you reconnect to the printer and drag the file onto the printer icon. The printer will chunter away in the corner and you, meanwhile, get on with something more interesting. For a detailed explanation of this, see last month's Hints and Tips.

Although many people refer to this method by the misleading title 'background printing', the intial stages of composing a document and converting into print codes hang the machine up for as long as they ever did.

In true background printing, all three stages should take place behind the scenes. This would require a composing program that would run simultaneously with other applications.

This idea is more appropriate to time-slicing operating systems (like Unix) than to the co-operative multi-tasking approach favoured by Acorn.

Background printing in fact does little or nothing to improve the overall time taken to print a single copy of a document; for that you need a faster printer, or a faster printer manager. It does, however, return control of the computer to the user significantly more quickly than by using the conventional method.

It is further enhanced in Risc OS 3 by a queuing system in the printer manager which allows you to drop several files onto the printer icon. These will be fed to the printer in the order received.

If, in the future, Acorn's minimum machine configuration is expanded to include a hard disc, it is likely that background printing will become standard. In the meantime, several manufacturers are offering solutions of their own. You will find more details on this in the Product Box on the left.

Types of printing

Under Risc OS, there are three main ways in which data can be sent to your printer. These are text mode, graphics mode or PostScript.

Text mode is the easiest to understand, and acts just like the old Beeb wordprocessors did. For each character in a text file (such as one produced in *EasiWord* or *Edit*), a one-byte Ascii code is sent by the computer. The printer then looks this up in its own memory, and prints the character corresponding to that code. So, for example, if Ascii 65 is sent to the printer, the printer will print a capital A.

As well as plain characters, the computer can send additional instructions to do things like underline, bold, italics and so on. In Risc OS 3, the codes which need to be sent to obtain these highlights can be altered

QUALITY & SPEED

The BJ-200 and BJ-230 are the latest black and white printers from Canon, the market leaders in bubblejet technology.

The BJ-230 is an A3 version of the popular BJ-200. Both printers come with a built-in 80 page sheet feeder and power supply. With a print density of 360dpi the print quality of both these printers is hard to distinguish from a laser printer and better than any other competing black and white inkjet printers. A sample A4 print out is available on request so you can make the comparison. And like all inkjet printers they are whisper quiet and both easy and cheap to maintain.

Both printers are supplied with Computer Concepts' super-fast TurboDriver printer drivers - printing and returning control on average between three and ten times faster than the standard Acorn drivers or the Ace PROdrivers. The RISC OS 3 versions of the TurboDriver also support rotated text and sprite printing, multiple printer icons on the icon bar and full PostScript style control over halftone screen density, screen angle and screen type. They can also handle 24 bit CMYK colour separation and so colour prints can be obtained by using colour inks and passing the paper through four times.

RISC OS 3 Turbo DRIVERS

We are so confident about these printers that we will guarantee that this combination of TurboDriver and BJ-200 or BJ-230 is the fastest, highest quality printer available for less than a laser printer, or your money back.

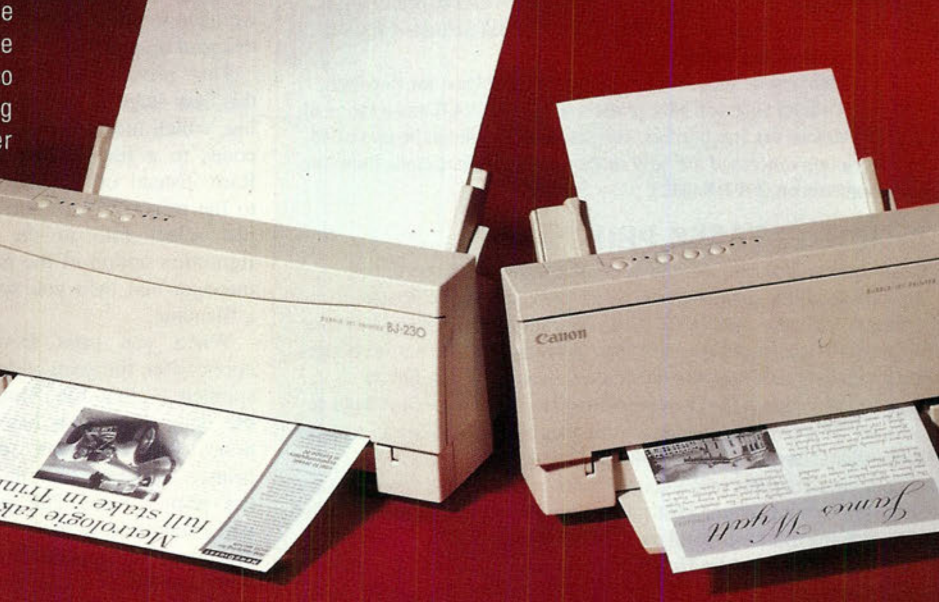
Price:
BJ-200 £275.00 + £10.00 p&p + VAT (£334.87 incl.)
BJ-230 £319.00 + £10.00 p&p + VAT (£386.57 incl.)

The package includes the BJ-200 or BJ-230 printer with TurboDriver software, a cable, sample A4 sheets of special high quality inkjet paper.

THE REVIEWER'S OPINION

" This is probably the best inkjet printer yet. ..whether used on its own or with the excellent TurboDriver, the BJ-200 is a fast printer and the print quality is simply superb. A winner."
Acorn User

" The TurboDriver excels at its task of providing quick, high quality output.."
".. In my opinion it is well worth the money and will more than pay for itself in terms of better productivity."
Acorn Computing



NEW A3 MODEL NEW LOW PRICE

NB: The BJ-230 is only suitable for use with RISC OS 3.1. The BJ-200 can be used with both but please specify which will be used at the time of purchase. Suitable for all models of Archimedes, but a minimum of 2 Mbytes of RAM is required.



Computer Concepts Ltd

Gaddesden Place Hemel Hempstead Herts HP2 6EX

ORDER HOTLINE FOR IMMEDIATE DESPATCH: TELEPHONE 0442 63933 or FAX 0442 231632

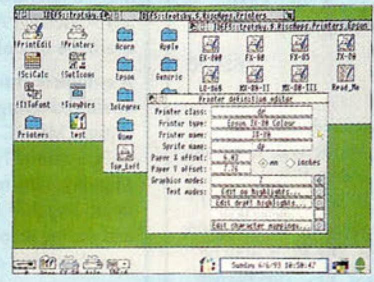
Editing a definition file

Here's a step-by-step example showing you how to change the characteristics of a printer driver to suit your needs. In this case, imagine someone who has an Epson JX-80 colour dot-matrix printer and wants to change the draft italics highlight to produce orange text instead of italics.

1. Go to the printer manual and find out the control codes for the desired effect – changing print colour on a JX-80 is shown as ESC r, followed by a number (0-6) for the colour where orange is 5 and black is 0.

2. Run *PrintEdit*, and then open the *Printers* directory, followed by the subdirectory for your make of printer (Epson in this case). All these files are on the Risc OS 3 applications disc.

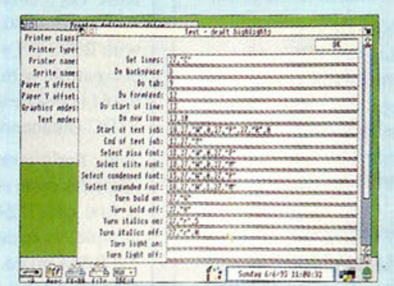
3. Find the printer definition file for your printer (JX_80 for the example). If your particular model is not mentioned, consult the printer manual and/or the *Read_Me* file for a suitable alternative. When you drag the relevant file into the *PrintEdit* window, the printer definition is loaded into *PrintEdit*, and the icons in the window will slowly fill up.



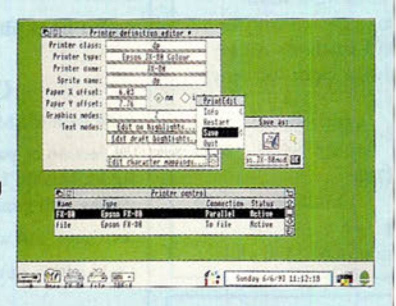
4. Click on the mode you wish to edit (Edit draft highlights in this case).

5. Find the lines you want to change. In this case, the Turn italics on and Turn italics off lines, say, 27,"4" and 27,"5" respectively. These instructions are called escape sequences and are distinguished from the printed text because they start with Ascii code 27. In the Epson manual they're referred to as ESC 4 and ESC 5. If you're unfamiliar with printer manuals, look them up to ensure that you understand what's going on.

6. Replace the original instruction with your new one. That is, ESC 4 becomes ESC 27 r 5 or, in other words, the string 27,"4" is replaced with 27,"r",5. Similarly 27,"5" is replaced with 27,"r",0. This effectively means that when italics are turned on or off, the code for orange text will be sent.



7. Click on OK and then save the modified printer definition file under a new name, keeping the original for reference. The save box can be brought up by clicking Menu over the *PrintEdit* and moving into the Save submenu.



8. Drag the modified printer driver file into the Printer control window of the printer manager then click Menu and choose the Configuration to check that the modified text mode has been selected in the Text quality icon. Then save the choices using the printer manager's iconbar menu.

9. Next time you use that mode (say, draft copies from your wordprocessor or spreadsheet) the new effect should work whenever you use italics. You can replace any effect with any codes, all using *PrintEdit*.

using the printer definition file editor *PrintEdit*.

Text modes are fast because they require minimum processing but they're fairly dull to look at as they only print text. Common uses are for printing program listings, simple word-processing and mail labels.

In graphics mode, images are sent to the printer as a stream of bits. These are then reconstituted as dots on the page. DTP packages print outline fonts in this way, by breaking each character down into dots and outputting these to the printer. Because this generates a lot of bits of information, printing can take a long time.

The number of graphics modes (resolutions) available varies from printer to printer and you can use *PrintEdit* to modify them or, indeed, to create new ones.

If you are fortunate enough to own a PostScript printer, you needn't worry about any of this. PostScript is basically a programming language for describing pages, and when the PostScript driver is chosen, images are sent to the printer in this language. Try printing to a file using a PostScript driver, and load the file into Edit; you can see that the contents of the file is in some kind of language.

In the case of PostScript, the only thing you get to edit from the desktop is the list of aliases relating desktop fonts to those stored on the printer, using an application called *FontPrint*. This is because PostScript printers have a number of outline font definitions already built into them.

Problems

Once you've got the hang of using *PrintEdit* and you've come to terms with the massive list of control codes in the dreaded printer manual, many problems become trivial. Here are some examples of common questions, all easily solved when you know how.

Q I've got a really obscure dot-matrix printer and there's no printer driver for it on my Risc OS 3 applications disc. Where can I get one?

A Unfortunately you probably can't, but if you investigate your printer manual, it'll probably tell you that it can emulate some printer for which there is a driver, usually an Epson.

Q When I print in text mode everything comes out in double spacing, even when it should be single. Why is this?

A When a carriage printer starts a new line, it does two things – it moves the print head back to the left margin (a carriage return, Ascii code 13) and it rolls the paper up by one line (a line feed, Ascii code 10). Printers are often set up to feed a line automatically every time they get a code 13, and you need to configure your printer not to do this. This usually involves setting Dip switches on the printer. Alternatively, use *PrintEdit* to stop the Arc sending line feeds with each new line.

Q When I try to print £ signs, I get # characters instead. How can I put this right?

A The Ascii character set definition doesn't cover all the characters in the world. This means non-standard characters like the pound sign (which is non-standard because Ascii is American) can have different codes on different printers.

The way to stop this incorrect character-mapping happening is to consult your printer manual to find out what character(s) the printer needs to receive to print a pound sign. Then call up the character mappings option in *PrintEdit* and write the new codes into the definition for character 163 (the Archimedes code for '£').

In conclusion, if you're buying a new printer, the best advice is to buy one that is supported by Risc OS 3 or one that comes with its own reliable driver software. If you have a printer that is not supported, then read its manual and the *Read_Me* files in the *Printers* on your applications disc to see which definition file produces the best approximation. Everything might not work correctly, but at least you will be able to do your printing.

IN BRIEF

We take a look at the high resolution update of HCCS' video digitiser. Plus, the first Arc version of Fujitsu's 3.5in magneto-optical drive

HIVISION

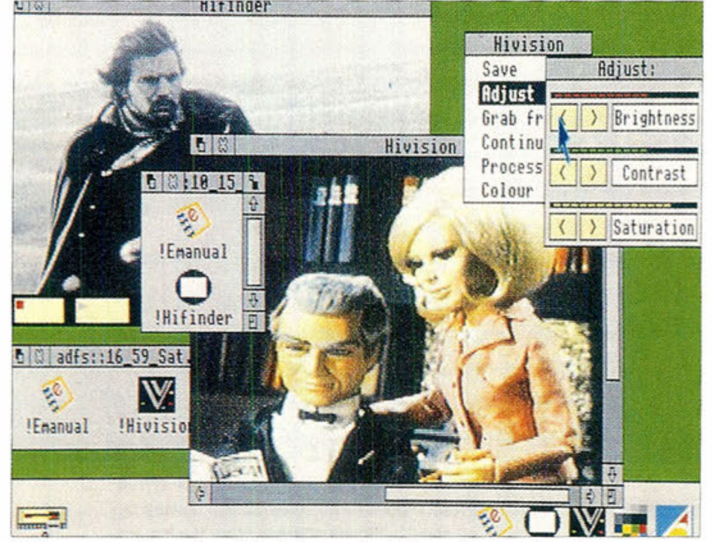
Supplier: HCCS
Tel: 091-487 0760
Price: £129 (£45 for Vision or CVision upgrade) plus VAT
Machines: All Archimedes

This is the long-awaited high-resolution version of the company's budget video digitisers. HiVision will cost you just £129 (or £45 if you already have a mono Vision or colour CVision digitiser).

Supplied as a single half-width podule with single phono socket for video input (just two memory chips for the upgrade) along with two software disks, HiVision digitises any composite video source from a VCR, satellite receiver, camcorder or whatever to produce 720 x 508 sprites in 256 colours (Mode 21).

Manuals for the software are supplied on disc in HCCS' *!Emanual* format. The main part of the software is the *HiVision* application. This produces a window with connected video displayed inside.

The desired image can be grabbed and then processed to display full-resolution black-and-white or colour images, stored as a sprite. Brightness, contrast and colour saturation control is possible.



TV images can be captured for later manipulation with an art package

The processing takes seconds for mono or a few minutes for colour but the results are worth it. With a decent camcorder you can enter quite reasonable family portraits into your Arc or capture TV characters for manipulation in an art package.

The only problem is the slow update rate of the image. If the image is fast moving it's next to impossible to grab the right frame. This is where *HiFinder* comes in.

This displays a fast updated image with simple start/stop controls. Loading *HiFinder* with *HiVision* lets you grab the right frame in the board's store then process and store it with the main application.

This has got around the few problems of Vision and CVision. For graphical input for the Arc, HCCS' baby is worth every penny.

Geoff Bains

MO DRIVE

Supplier: The Serial Port
Tel: (0749) 670058
Price: £999 for external 120Mb option

The future of storage looks like a 3.5in floppy. It holds 120Mb, fits your shirt pocket, and it's ideal for secure backing up.

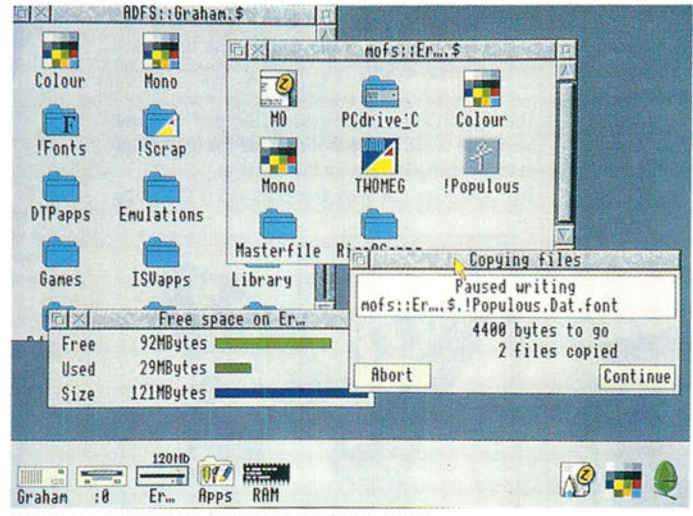
The Serial Port is the first company to supply the Fujitsu M2511 3.5in magneto-optical disc drive for the Arc. MO mechanisms are usually quite a bit larger than 3.5in hard discs, and, because of the laser, have a beefy fan to keep them cool.

But the Fujitsu-built drive is a jewel – as well as being the fastest MO drive on the market, it's exactly the same size as a floppy disc drive. So you could fit it into your A5000 as an internal drive.

The external version is in a large metal box, with its own power supply and fan. Making the SCSI connection is simple if you remember the SCSI ID has to be different from both your card (always number 7) and any SCSI devices that you may already have.

Take the terminator off your last SCSI device, link the MO, and then put the terminator back on.

The Serial Port supplies a SCSI-card independent formatter and filing system, so whatever SCSI card you have, it is pretty foolproof. You load the MO filing system modules and from then on use the MO discs as floppy discs.



Yes, that really is 121Mb free on the floppy drive

Except they are about 160 times bigger. And faster. Performance when loading is a tad slower than a hard disc, around 610K per second, though saving is only a third this speed.

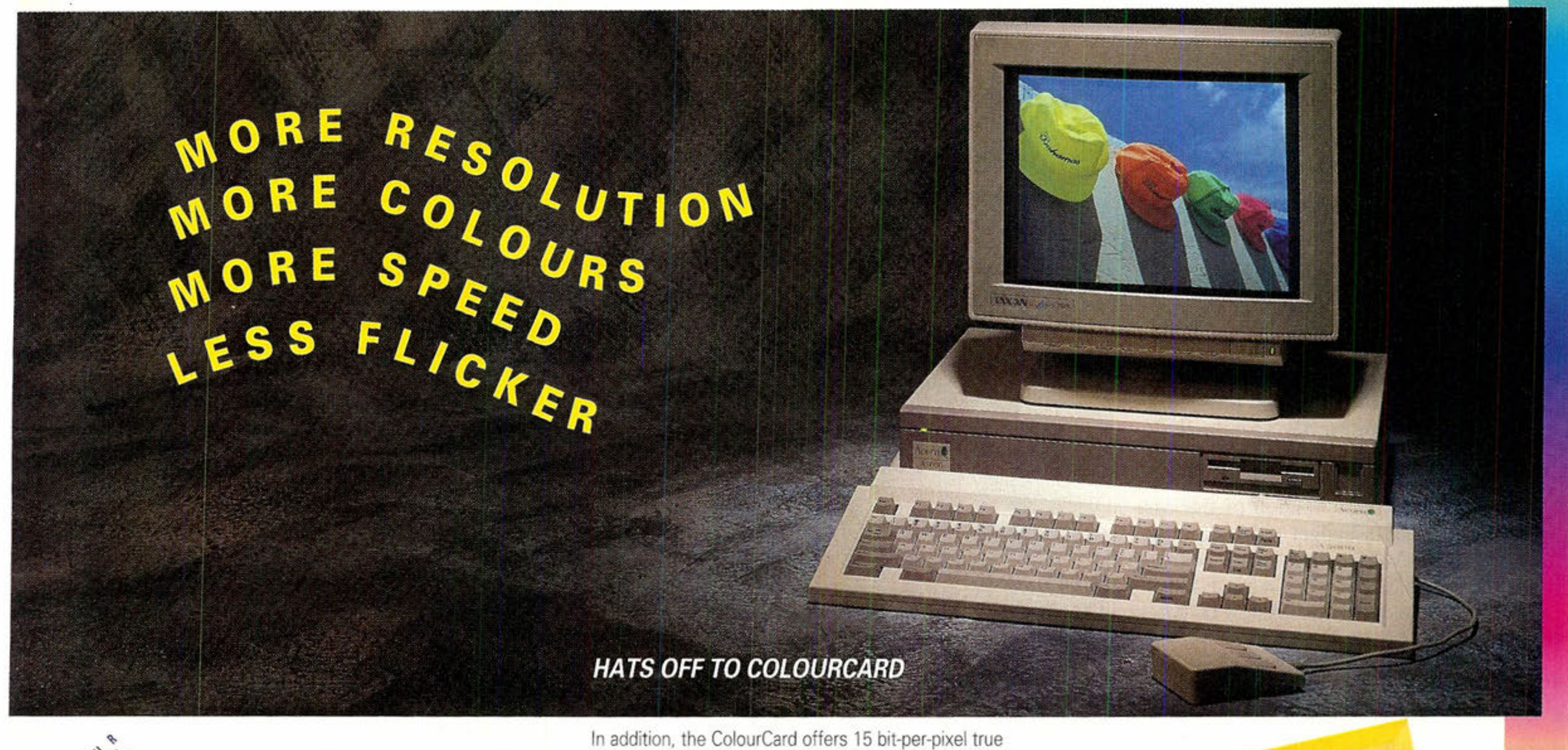
The software has nice touches: the disc name is displayed on the iconbar, and the free space display multi-tasks. I had no problems, even when I was, performing several simultaneous filer operations.

The verdict – glorious. Syquest drives are the only competition: true, they are cheaper, but the Syquest cartridges are more expensive, have smaller capacity and are less reliable than MO discs. Nor will a Syquest drive fit in your pocket.

Graham Bell

THE ColourCard

FOR THE ARCHIMEDES





A new graphics accelerator card for the Archimedes, the ColourCard brings a host of improvements to the video capabilities of any Archimedes A300*, 400*, 540 or 5000 series computer.

The simple to fit, single width expansion card is completely compatible with all RISC OS desktop software, but brings much higher screen resolutions at higher screen refresh rates (less flicker and easier on the eye).

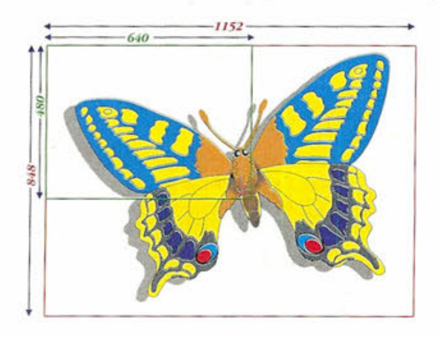
In 16 and 256 colour screen modes all the colours are selectable from 16 million hues. This means scanned pictures can be seen with 256 true grey-levels on screen and that you are no longer restricted to the preset Acorn palette. Some applications, such as ArtWorks, can provide better screen colouring using the new palettes.

In addition, the ColourCard offers 15 bit-per-pixel true colour screen modes having over 32,000 colours on screen at once. Although these screen modes are not yet desktop software compatible, it is expected that programs will become available that take advantage of the modes. The ColourCard is supplied with a 24-bit preview utility to show 24-bit Clear files in stunning full colour.

The ColourCard reduces the load on the main Archimedes memory and so allows the ARM processor to run much faster than would normally be possible in high resolution screen modes. Depending on machine and screen mode, graphic operations can be up to twice as fast.

The ColourCard revolutionises DTP and graphics work, and opens up the world of true-colour graphics to the Archimedes user for the first time.

The ColourCard has been developed and is backed by the largest and most successful Archimedes developer. It is available now, and for added peace of mind comes with a 14-day, no quibble money back guarantee.



ColourCard offers 3 times the pixel area of standard Acorn VGA mode 27.

SOME OF THE SUPPORTED SCREEN RESOLUTIONS

Colours	Resolution	Refresh
16 colours	1600 x 600	65Hz
	1024 x 768	72Hz
	1152 x 848	64Hz†
	1280 x 512	80Hz
256 colours	800 x 600	85Hz
	1152 x 424	80Hz
32,000 colours	800 x 300	80Hz
	576 x 424	90Hz

KEY COLOURCARD FEATURES:

- ArtWorks version1.1 now supports 32,000 ColourCard screen modes
- Video pass through for guaranteed compatibility with all software without having to unplug your monitor
- 15 bpp (ie 32,000 colour) screen modes
- No quibble money back guarantee
- A3000 version now available
- New configurable screen update speed

*(The ColourCard is compatible with all multi-scanning monitors. †Only higher scanning rate monitors can manage 1152 x 848 resolution. Lower scanning rate monitors may display some resolutions at lower refresh rates. *A300 and early A400 computers may need an additional Genlock connector to be fitted internally.)*

Price £249.00 +£6 p&p + vat (£299.62 inc)
Available from all good dealers and from:



WILD VISION
15 Witney Way, Bolden Business Park,
Bolden Colliery, Tyne & Wear, NE35 9PE
Tel: 091 519 1455 Fax: 091 510 1929



Computer Concepts Ltd
Gaddesden Place, Hemel Hempstead,
Herts, HP2 6EX
Tel: 0442 63933 Fax: 0442 231632

E&EO Details are subject to change without notice.

Business matters

From logos to business cards. Rob Miller explains how to produce striking stationery

Anything that is used to illustrate a concept can be regarded as a logo. Acorn's familiar green symbol is a clear example, as are the three letters that make up the BBC logo on the cover of this magazine. Less obvious is the way something is actually written, like *The Guardian*'s distinctive masthead.

By choosing the right lettering (or font) and, possibly, a suitable graphic, it's straightforward to get an idea across. There's no need to spend thousands of pounds (like one phone company I could mention) to produce the desired result. Armed with an Archimedes and *Draw*, it's possible to get professional results.

The first step in designing a logo is to think what image you are trying to portray. It's obviously wrong to use a modern design for an antique business, or an Olde Worlde logo for a company producing hi-tech products.

There's a certain amount of psychology behind the right design. Text displayed in a classical font gives an established air to a company logo whereas a more informal font creates an easygoing feel. It comes down to taste, but you can see whether a logo is right for the job.

Designing a logo

First, decide what character style, or font, you wish to use. The Archimedes has a massive selection of fonts, covering virtually every style imaginable. There are a number of companies producing fonts for the Arc, such as The Electronic Font Factory and Design Concepts. Both sell font families from between about £7 to £30. These are hand-drawn and the quality always good.

A third source is by purchasing a program such as Computer Concepts' *ArtWorks*, which comes with over 200 free fonts. Other applications on the market, such as wordprocessors and desktop publishing packages, usually come with a selection of fonts that you can add to your collection.

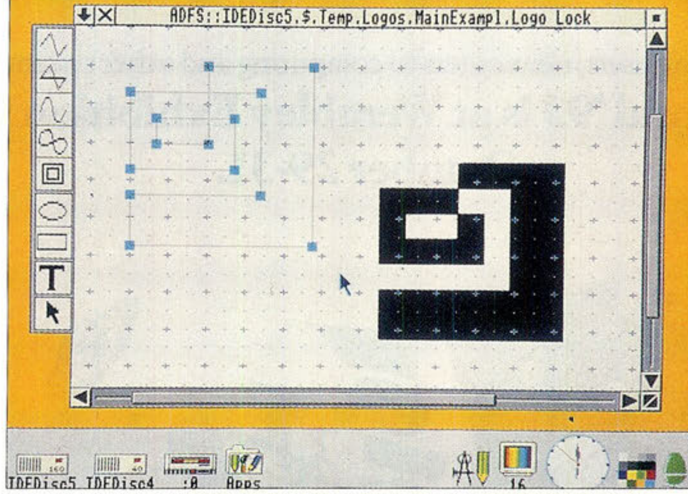


Fig:1 The logo is laid out, the grid-lock tool allowing accurate positioning

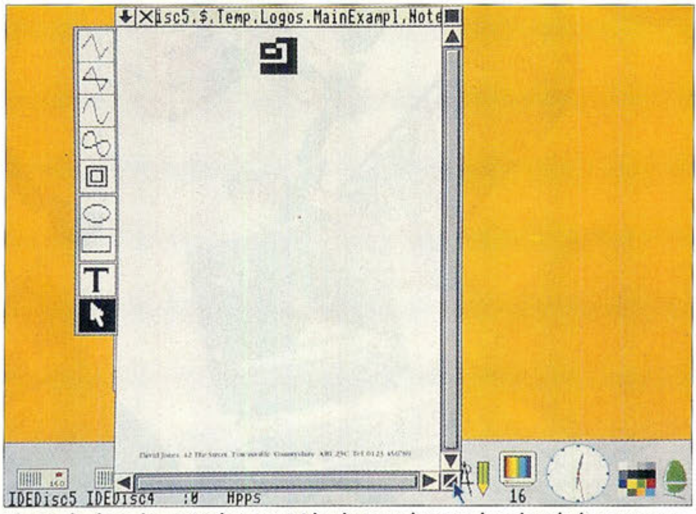


Fig 2: The logo is centred on an A4 background to produce headed notepaper



Fig 3: A balanced business card produced by coupling logo and address

A serifed font (with tails on letters) gives a more personal look to a piece of text. Try loading *Draw* and comparing text, first in Trinity, then in Homerton and see what I mean. Details of using *Draw* are given in the Applications Guide with your computer.

Garamond is similar to Trinity but more rounded and is ideal for letterheads. There are several versions for the Archimedes. Because of copyright laws, a font on the Arc will have a different name to a similar one on another make of computer. Don't assume that a company doesn't produce a particular font, just because you can't find the name.

The picture

As well as lettering, a logo can incorporate a picture or symbol that illustrates the company or individual involved. More practically, the symbol should be designed so it is easy to position next to text (the name and address) with balance. Symbols with flat, vertical sides work best as it's easy to justify text against them.

One of the easiest ways of designing a symbol is to take the initial letters from a company's or individual's name and join them together in some way, such as a monogram. All sorts of text styles can be used (they needn't be the same as that used for the name and address) from simple block lettering to illuminated characters such as those used by monks in medieval times.

You could have a go at producing your own symbol or, if you're not particularly hot on the design front borrow one. It's obviously unacceptable (legally and morally) to copy direct, although it's fine to adapt ideas.

There are a number of books aimed at designers, all of which could spark you off and inspire further ideas. One in particular that I can recommend is *The Encyclopaedia of Signs and Symbols* by John Laing and David Wire, and published by Studio Editions (ISBN 1 85170 967 3). The book includes all manner of drawings from cave paintings, through Celtic and medieval symbols through to 20th Century art deco work.

The Grand Design

For this example, I've chosen a simple, block-type monogram, consisting of the letters 'D' and 'J'.

I created the logo in *Draw* using a single, closed line. The black-and-white areas were produced by positioning control points on the line so certain parts of the shape overlapped (see figure 1). The grid-lock tool was used to position points accurately.

The right and bottom sides of the monogram were made thicker to give something to place the name and address against, and to provide an underlined effect.

Three of a Kind

The three types of stationery you're likely to need are notepaper, business cards and compliment slips. Each has different dimensions and this affects the way you position the logo.

The traditional way when writing a letter to someone is to place your address at the top right of the page and the person's address underneath and to the left.

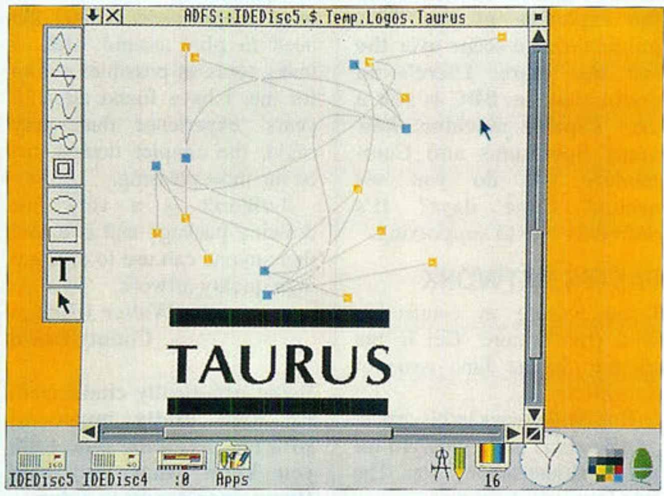
With notepaper for a business, it's more important to keep the address separate so it's easy to see at a glance. For this reason, the name and address block is positioned at the bottom of the paper on a single line, making it easy to locate and read.

The monogram can be positioned anywhere on the paper, but having it at the top, in the middle of page, gives it a balanced and authoritative look.

To centre everything on the page, a rectangle the size of the page was created in *Draw* and the name and address and monogram were then positioned horizontally by hand.

The design company

I've gone for a combination of abstract image and classical text. The Taurus logo was produced in a similar way to the main example, overlapping used to produce a stark, black-and-white contrast. Curves were used instead of straight lines. The image was inspired by cave painting designs depicting men hunting bison. A non-serifed font (Optima) gives the logo an authoritative look and capitals suit the single-word company name.



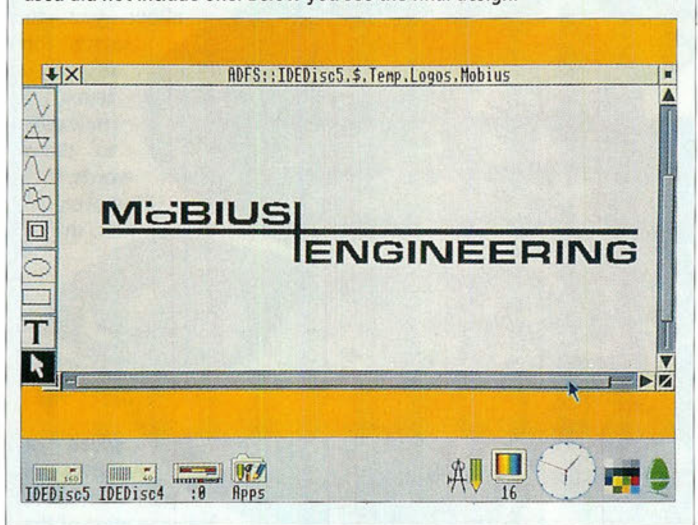
The engineering firm

In the second example we are designing a logo to be used by an engineering company.

The firm wants to give an impression of precision and organisation. A logo for such a business should therefore be neat and exact, as well as being clear and bold.

A large, square font (Microbus) was chosen for the job as it has a solid and chunky look to it. The grid formation, separating the parts of the company name, gives the logo a sense of organisation while being visually very striking. The framework idea again reflects the technical nature of the firm's business.

The umlaut over the letter 'O' had to be produced by hand, as the font used did not include one. Below you see the final design.



Useful addresses

The Electronic Font Foundry, Tel: (0344) 891355
Design Concept, 30 South Oswald Road, Edinburgh, EH9 2HG
Computer Concepts, Tel: (0442) 63933
TJ Reproductions, Tel: 081-451 6220

All objects were grouped together then justified using the Middle option. The group was then ungrouped and the large rectangle deleted. Figure 2 shows the final page and how your notepaper will look.

Compliment slips are primarily to acknowledge someone's communication, but without having to write a full-blown letter. Some white space is required for a brief note, therefore, but you can make the logo as large as you want.

In this example, I've simply taken the notepaper design and cut out the centre. Most compliment slips are printed on paper the same width as A4 but one third the height (210mm x 99mm). Using the grid in *Draw*, you can position the various elements.

A business card is, in effect, a reminder who someone is, who they work for and what they do. There's no need to provide an area to write on so all the space available can be used to get the necessary information across.

Placing monogram and name/address side-by-side provides a solid block, roughly the right shape to fit on a standard business card. If you consider A5 to be a sheet of A4 folded in half, then a business card works out as an A8 size sheet (52.5mm x 74.25mm).

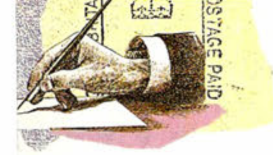
The monogram and name and address block can be positioned by placing them roughly together and then using the Justify tool to get the positioning accurate. Figure 3 shows the business card on screen, taking up a full A4, landscape page. This makes printing easier to do.

Printing your work

Note paper and compliment slips can be printed out full resolution, as they appear on the page. A laser printer will be fine for this. A print bureau will be able to do this for you.

It's unlikely you'll have a printer capable of printing onto small cards, so it's easier to print out the card design onto a sheet of A4 and get a print bureau to shrink it (and print it) for you. This system of photo-reduction also improves the print quality.

All the examples in this piece are included on this month's 3.5in disc.



£15 STAR LETTER

I wonder if you can help me. I have just got back into the Acorn scene, after many years away, by buying a second-hand BBC micro.

I'm thinking of starting up a fanzine called *Byte Back* for anybody who has a BBC micro, and perhaps wants to learn more about it or has knowledge that could benefit other people.

As far as I'm concerned, the way someone's interest in anything is kept alive is by being able to share it with other people with similar interests. It doesn't matter how 'old' the subject is: take vintage car colllectors for example. I truly believe that the BBC micro is one of the best machines ever built, even today. I love being able to inerface it with just about anything I can possibly think of.

The concept of *Byte Back* is to show BBC micro users that people still love the machine for what it can do – not everyone has left it behind to 'upgrade'. If anybody would be interested in the idea of *Byte Back*, I would be very pleased if they would drop me a line at this address. I'll reply to every letter I get.

Paul Harvey
Byte Back
33 King Henry's Mews
Enfield Lock
Middlesex
EN3 6JS

What a breath of fresh air. As we have mentioned in previous months, our coverage of eight-bit machines has, for very obvious reasons, dwindled compared to the space devoted to 32-bit machines; however, don't take this as a pronouncement on the eight-bit scene.

Ideas such as this could prove the most creative force in the eight-bit market since the explosion of the BBC public domain scene over the last two years. There's no doubt that the BBC is still a very capable machine: how many Spectrums and Commodore 64s do you see around these days? It's definitely worth supporting.

FASTER ARTWORK

I am writing in connection with your feature 'Get in the Picture' in the June issue of *Acorn User*.

Rob Miller says in his article '*ArtWorks* is not a program for the impatient among you. The tree frog took four days.'

The illustrations I enclose took no longer than one day to create in *ArtWorks*. I am a professional graphic artist, but *ArtWorks* has only been out for a few months and it is the first vector graphics art package I have used (apart from *Draw*). So, I would say that *ArtWorks* is not slow, but it is the artists who take a long time to produce the effects they want.

It seems *ArtWorks* is maligned a great deal because of the complexity of its tools, and its apparent slowness because most people seem to feel the need to play around with as many tools as possible: not so for me. I have found after 20 years' experience that, very often, the simpler design can be the most pleasing.

ArtWorks is a very fast drawing package and is a tool that anyone can use to produce high quality artwork.

Walter J Briggs
County Down

Being artistically challenged, we were pretty impressed with the peregrine shot. Still, you know what they say: Rome wasn't built in a day.

NOT SO ORGANISED?

Ian Burley's review of *Knowledge Organiser 2* in the June issue, though broadly favourable, is in danger of wishing second-rate PC text retrieval software onto the Risc OS platform.

Almost without exception these packages automatically compile global indexes of almost all word occurrences, and then allow you to 'search' for text items indexed to these words. However, the speed of retrieval is pure illusion, because most of the word occurrences in text are insignificant.

Yes, *KO2* unapologetically obliges you to adopt a more intelligent approach – as does any important software genre. Its learning curve is no steeper than that required for, say, *Draw* or *Impression*, but the rewards far outweigh the drawbacks in terms of fast, accurate and thorough retrieval.

Measuring *KO2* against a PC yardstick does not, in my opinion, qualify as serious attention. Text retrieval, when it works, is every bit as exciting as the more visually or musically-oriented software, to which you devote far more time and space.

Sean O'Conaill
***KO2* creator and designer**

Ian Burley replies: 'There is always a trade-off between sheer convenience and ultimate power and sophistication. *KO2* requires a lot of dedication to build up a decent database. The "second rate PC text retrieval systems" I referred to in the review can be installed and enable you to find any occurrence of, say, "*KO2*" on your hard disc in a matter of minutes – and most of the work is done for you.

'Yes, *KO2* is much more powerful, but the alternatives are much easier to use. I'd like to have seen a combination of the two. For me, *KO2* is a bit like running before you can walk.'

PERSISTENT RENDERER

I read your article 'Graphics Rendered Simple', and as a tracer-holic, I wish to advise others who are interested, but who cannot afford the commercial packages, of a PD package called *Persistence of Vision Ray-tracer*, or *PoV Ray* for short.

It is the best 24-bit colour ray-tracer available in the public domain, and competes favourably with professional packages costing up to £2000 on the PC.

It has the advantage of having compatible versions available for Cray supercomputers, Sun Sparc stations, Unix workstations, Macs, PCs and (running slowly) Ataris and Amigas as well.

POV Ray is available from public domain libraries such as Arch Angel, [who you can contact on (0392) 422759].

Toby Bryans
Wembley Park

Video and Graphics from Wild Vision

Designers, manufacturers and purveyors of fine expansion cards for the Acorn range of 32-bit microcomputers*

➤ Wild Vision Digitisers

Hawk V9 MkII

The *ultimate* real time colour video digitiser: in designing the Hawk V9 MkII, Wild Vision have drawn on years of image capture expertise for the Acorn platform. State-of-the-art technology provides hardware processing capabilities *unique* to the Hawk V9 MkII, ensuring you get the image *you* want. Plus, high quality software is provided enabling still images to be grabbed in a variety of formats, including greyscale. Whether you need images for Art, for DTP or for presentations, chances are you need the Hawk V9 MkII. Price £269.00**

GreyHawk

Wild Vision's DTP† video digitiser! GreyHawk is the ideal image capture medium for DeskTop Publishing work. Coupled with Computer Concepts' ScanLight Plus application, GreyHawk offers true 8-bit greyscale video digitising in real time. Processing options include, *blur, sharpen, rotate, crop*, and a host of other operations. The perfect compliment to Wild Vision's colour digitiser range, GreyHawk has been designed and manufactured using the latest technology. It offers 256-greyscale functionality without compromising on performance or flexibility. GreyHawk is also excellent value at an introductory price of only £99.00**

➤ Wild Vision Genlock and Overlay

Chroma-Genlock

Calling all budding Spielbergs! Unleash your creativity! Wild Vision's Chroma-Genlock lets you superimpose computer graphics onto video to achieve effects like captions, credits and animation. A software application, !SideShow, is included with the genlock card to enable you to overlay text, drawfiles and sprites created in !Draw. The card is also compatible with other software titles. Suitable for use with all Acorn 32-bit machines*†† Price £215.00**

➤ Wild Vision Graphics

ColourCard

Graphics handling that *no-one* should be without. ColourCard offers more speed, more colours, more resolution and less screen flicker. It is suitable for Archimedes 300/400/500 series machines††, the A5000 and A3000. Screen update speed is configurable to 12 or 24 Mhz, broadcast resolution PAL modes are provided for your video needs, and 32000 colour modes provide excellent preview facilities. All this on one card – at one price. £249.00**

The above cards have all been designed and manufactured to comply fully with Acorn specifications for expansion cards. In particular, please note that the GreyHawk, in contrast to some other low-cost digitisers, has been crafted to these specifications and meets the very highest standards of production. Software for all the above products has been developed in conjunction with Computer Concepts.

* Excluding the A4 computer
** Price excludes carriage and VAT
† DTP: Digitising to Perfection!
†† Early machines may need a genlock header fitting – see your local dealer for details

Also available from Wild Vision

- Chroma 150 PAL encoder unit: record your computer output to video.................£185.00**
- A3000 Expansion Box: use up to three Archimedes expansion cards with your A3000.................£139.00**
- Hawk V12 Video Framestores: convert your Archimedes into a high performance image processing and analysis system.................from £1990.00**
- ADC1208 range of analogue to digital converters: data acquisition tools for a variety of scientific applications from.................£560.00**
- Chroma 250/350 enhanced performance genlock cards.................£395.00**

For more information on any of the above, contact Wild Vision

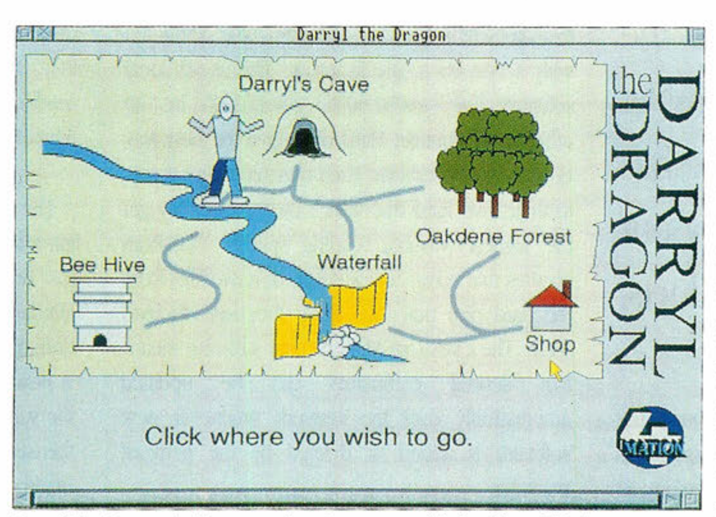


WILD VISION
15 Witney Way, Boldon Business Park
Boldon Colliery, Tyne & Wear NE35 9PE
England.
Tel: 091 519 1455
Fax: 091 519 1929



DARRYL THE DRAGON

Supplier: 4Mation
Tel: (0271) 25353
Price: £19.50 single copy, £39 site licence, £10 for the photocopiable pack



Darryl the Dragon is the new adventure game offering from 4Mation

The use of adventure games in infant classrooms to promote reading and creative writing is not a new concept; children are happy playing heroes and heroines who venture into forests, climb cliffs, mix magic potions and solve logical problems in order to save others from fates worse than death. A new game called *Darryl the Dragon* gives young children ample opportunity to come to the rescue of Darryl who has a sore throat and no flames.

The software is on two discs, the first of which is copy protected unless a site licence has been bought, but the company allows purchase of extra key discs at £10 a time as an alternative. The manual is easy to read and contains a short story to get the children started, instructions on how to use the program and the answers for busy teachers. There are also suggestions for related work. The children's position can be saved at any time and teachers can preset three levels of difficulty.

The first part of the adventure requires children to help Darryl by getting some honey from the beehive for his sore throat and some matches from a machine to light his flames again. Most of the problems they encounter are relatively easy and they are aided by a simple map. The writing on each screen is short and easy to read but younger children will inevitably need to have help. Further controls are available and teachers can choose which font and size of text will appear.

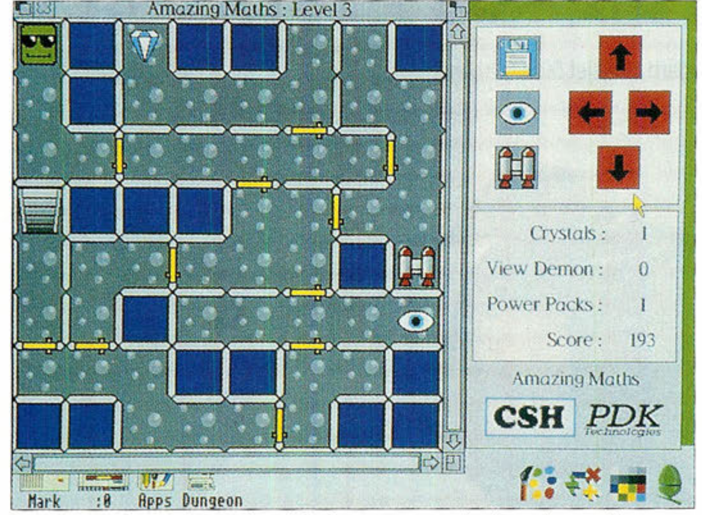
Having soothed his throat and rekindled his flames, we then have to rescue Darryl's fireproof handkerchief from the nasty wizard. This involves a visit (or lots of visits if you keep going wrong) to the wizard's castle. There are a number of rooms to go into, locked doors to open, problems to solve and hazards to overcome in order to get Darryl's essential piece of property back for him.

This is an easy game for infants to play, the screen graphics are colourful and move fast, but the feature that finally sells it to me is the pack of photocopiable resources available to support the adventure. This pack includes *Giants Monthly*, inflammability charts, a Happy Valley School for Dragons Report and a host of other material that goes with each aspect of the game. It will keep children busy and teachers happy for some time.

Clare Johnson

AMAZING MATHS

Supplier: Cambridgeshire Software House
Tel: (0480) 467945
Cost: £19.95 + VAT, primary school site licence £39.90, secondary school site licence £59.85



Move around Amazing Maths with the on-screen or keyboard cursor keys

If your children enjoy video games and need help with simple arithmetic problems, then *Amazing Maths* is for you. Moving around a grid, each obstacle generates an arithmetic question which has to be answered correctly before you can move on.

The game is based on a series of fifteen grids, each of which is more complex and is reached via a staircase from the previous floor. Each floor has walls and gates separating you from objects, including power crystals, which you might wish to collect and these can only be passed by answering a question correctly. However, if you get a question wrong you lose a crystal, and if you don't have any crystals you are out of the game. It is also important to collect jet packs which allow you to jump the wall. So far, all you need to do is answer the questions but hidden from view is a demon and if you land on this you get five questions. You can avoid this by collecting magic eyes that can be used to see where the demon is hiding, but you can only use each eye once.

One of the best features of this software is the amount of flexibility it allows in setting up the problems. The type of question can be set to include only the arithmetic functions you wish to test and you can turn the demon feature off as well. It is then possible to set the number range into which the questions will fall. You can also set the number of levels that the children face. There is the mandatory highest score table for all good games and the highest ten scores are recorded on disc. Positions can be saved at any time and since the software is fully Risc OS-compatible, screens could be printed out and used to make supporting worksheets. The game can be run directly from a Concept Keyboard or a touch screen and an overlay is provided with the pack.

Pressing the Menu button over the icon shows even more options. These include turning off the sound. It is also possible to set the time delay which controls the number of seconds pupils have to answer a question. The font used is large and easy to read but this can also be changed if desired.

This software gives great teacher control, is fun for children to play and could generate classroom activities. Aimed primarily at Key Stage 1 pupils, it should also appeal to special needs and the lower stages of Key Stage 2.

Clare Johnson



ClassNet/ClassRom Update

Since its launch at last year's Access IT conference, the Oak Solutions' ClassNet Ethernet interface has proved to be one of our most successful products.

A very large number of schools around the country are buying complete rooms of computers and require a networking system to interconnect them. ClassNet offers the benefits of using standard Ethernet components whilst remaining familiar to anyone who has used an Econet in the past.

Over the last few months there have been three major developments to ClassNet; combined ClassRom and ClassNet interfaces, the new ClassShare II software and 'network' interfaces for A3020 and A4000 computers.

The new interfaces provide a user of a hard disc machine with the ClassRom protection and management system for the hard disc combined with access to a fast Ethernet. This is an ideal solution for A4000/5000 computers in an educational context. Hard discs give the best way of loading applications. Each user has direct access to their own hard disc which means that they get the highest possible loading speeds. ClassRom ensures that users cannot delete or move files from the hard disc but does allow the users to load them. The ClassRom Management software means that several computers can be updated automatically over the network whenever new software is added or deleted by the network manager.

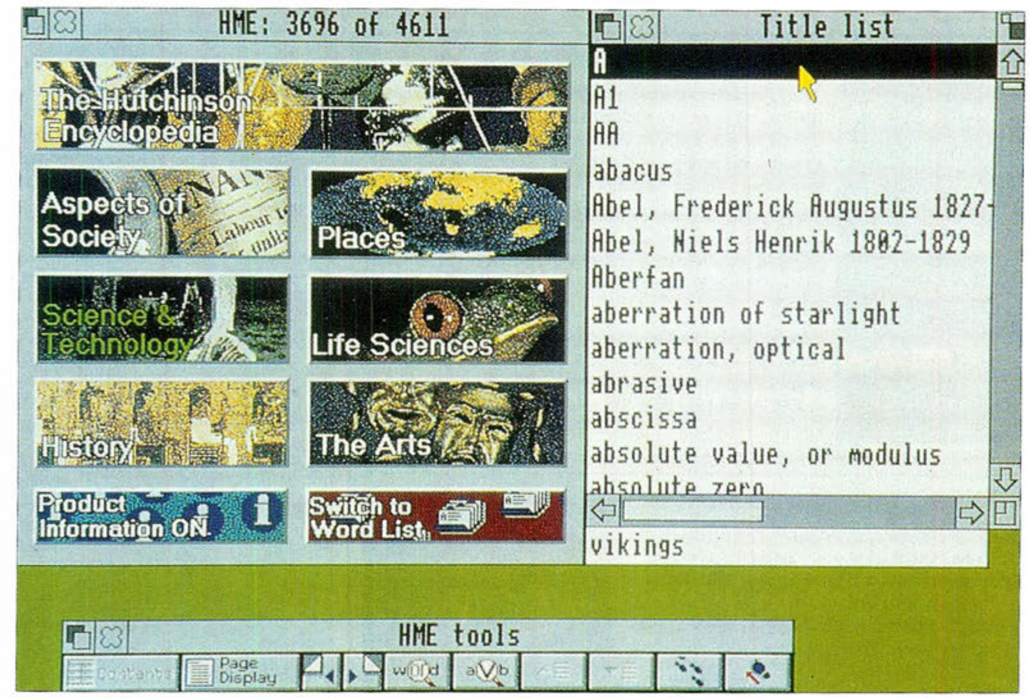
The new ClassShare II software is an extremely fast disc sharing system for users of ClassNet networks. If you have small clusters of computers which do not have their own hard discs then one way of loading applications is over the network. The Level 4 file server offers one system of loading applications but the performance is not as good as it could be. ClassShare II takes the performance of an Ethernet to new extremes. Users can share the hard disc of another computer, exploiting the bandwidth of the network to the full, with performance almost as fast as using local hard discs. In fact, each user sees a hard disc icon on their icon bar representing the hard disc of the computer being shared. This means that the children can use any computer in the same way; they don't have to learn a different system for machines with hard discs and machines on the network.

The launch of the A3020 and A4000 saw the introduction of yet another style of interface socket for Acorn 32 bit computers; the networking interface. This has meant that we have had to design a third type of ClassNet Ethernet card. This is now complete and should be available during the summer, ready for the autumn term. By using this style of interface rather then the A3000 style mini-podule, A3020 and 4000 users will not use up their only podule slot. The new ClassNet card will support both ClassRom and ClassNet software.

ClassNet cards cost £149 (education)
ClassNet/Rom cards cost £179 (education)
Bulk discounts available on request
ClassShare II costs £149 (upgrade £10 per card plus £35 for the software)

HUTCHINSON MULTIMEDIA ENCYCLOPEDIA

Supplier: Attica Cybernetics
Tel: (0865) 791346
Price: £149 + VAT (users of the Dos-based version can upgrade for £75 + VAT from Cumana Ltd, tel: (0483) 503121)



To access information you can select a heading from the title list or type in the word you want to search for

As the first multimedia encyclopedia written specifically for Risc OS, this CD-Rom is something of a landmark: it has over 1500 photographs, maps and illustrations and in excess of 250 sound clips to hand. The number of textual entries is over 27,000, organised into six major subject areas, ranging from places, life sciences and technology, to history, aspects of society and the arts. Unlike its printed counterpart, the beauty of the *Hutchinson Multimedia Encyclopedia* is that it provides ways of searching for information which are simply not possible with books.

In its previous incarnation the *Hutchinson* ran off a Dos CD-Rom with a primitive Risc OS front-end and thus was painfully slow in operation. The fact that it was primarily text-based meant that it was rather uninspiring as well. I was able to test the latest CD-Rom with one of Cumana's excellent new 600 series drives and it proved easy to install and get it going on an A5000.

The encyclopedia comes equipped with a disc of retrieval software which loads onto the iconbar. Clicking on this opens the contents page, title list and tool bar. The contents page offers the six subject areas and a choice of method for carrying out the search. The title list contains an alphabetical list of all the entries in the encyclopedia, whilst the tool box provides the application's control panel.

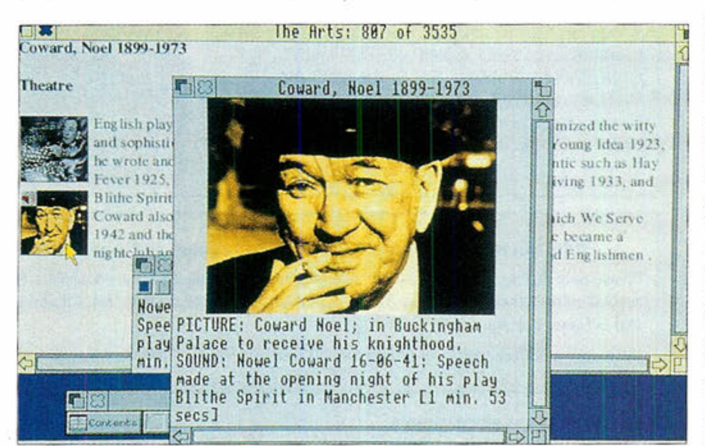
From the contents page you can choose the volume you wish to search. When this is loaded, the title list is updated and you can select an entry or type into a text field. In either case the relevant information window opens displaying textual data, and/or compressed images and a sound button. The text may contain highlighted words or phrases which lead to and from linked articles, whilst images (sprites) may be enlarged to a preselected size. If an audio sound clip is available, clicking on the sound button plays it.

The real power of the system becomes apparent when using the tools available from the tool bar. Here you can move to and from succeeding and preceding articles; move up and down stacks of articles; and return to the one you started with. Also available are single word and complex searches. The former looks for a solitary word or phrase while the latter makes use of logical operators (AND, NOT, OR) to track combinations of words or phrases. The result is always the same, regardless of the type of search, and the software sifts through the disc and compiles articles which contain the search criteria. The list can then be narrowed down by further searches.

Where computer-based resources score over printed materials is in their ability to extract information for a specific purpose. The *Hutchinson Multimedia Encyclopedia* is no exception. Complete articles, tables and marked blocks of text can all be saved for use in other Risc OS applications. Similarly, images can be saved as Risc OS sprites or as 'Device Independent Bitmaps' – a means of transferring an image to other hardware platforms. With the exception of DIBs, all items can be saved to other desktop applications or to disc. Text and graphics can also be printed directly from any screen, providing a suitable printer driver is installed, so the encyclopedia offers a prime source of information for school projects. The level of language and its presentation make the resource most suitable for Key Stage 3 and 4 pupils or adults.

The problem with a CD-Rom application as broad as this is the compromise between the detail and quantity of information offered. What the *Hutchinson* sets out to do it does very well but I found it rather dry. There are no moving video clips to enjoy and the sound clips are not extensive. To my mind, these are fundamental to multimedia.

If this encyclopedia was a compilation of six CD-Rom volumes, one for each of the subject areas, then perhaps more space would have been available for movies, sound clips and extra information. This would make the whole thing more entertaining.



The Hutchinson has photographs and illustrations but no moving video clips

Conclusion

However, as it stands, the *Hutchinson Multimedia Encyclopedia* provides a dependable source of information with fast search and retrieval software, and it certainly represents a big step forward from the original Dos-based version. To run the encyclopedia you need Risc OS 3.1, 1Mb Ram, SCSI interface with CDFS 2.1 or later and a CDFS CD-Rom drive.

Chris Drage

SUPERIOR SOFTWARE

ACORN A3000, A3010, A3020, A4000, A5000 & ARCHIMEDES




TECHNODREAM

At last, the action-packed sequel which everyone has been waiting for! Now, in addition to a 1 player option, you can choose to have 2 players simultaneously. Now, in addition to horizontal parallax scrolling, there is vertical scrolling to give a much enlarged playing area.

There are 18 increasingly fiendish stages, with brilliant arcade-quality graphics and massive animated sprites, plus digitised sound effects and 6 atmospheric pieces of stereo music. Control by keyboard or joysticks (Acorn A3010 or RTFM).

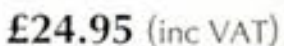
"Technodream's action gets so fast and furious the screen looks like an abstract painting. A highly polished product and well worth the asking price of £25."
...BBC Acorn User (May 93)

£24.95 (inc VAT)

SPEECH!



Give your computer a voice with this high quality speech synthesiser, which is both easy to use and very flexible. It can directly speak words you input or text files, or you can use phonetic input to add stress/intonation, speak foreign languages or even sing! An easily modified spelling program is included.

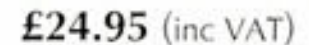


£24.95 (inc VAT)

REPTON 3 – FOUR GAME COMPILATION



Four of the most popular strategy games ever produced for Acorn computers in one great value-for-money package. **Repton 3, Around The World In 40 Screens, The Life Of Repton** and **Repton Thru Time** – with choice of four tunes and a position Save/Recall facility, plus easy-to-use screen and character design and editing facilities.



£24.95 (inc VAT)

EGO: REPTON 4



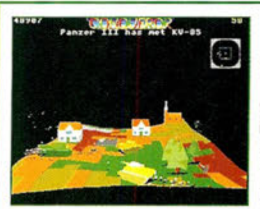
Ego, the wisest of all the Repton family, now presents the cleverest and most puzzling of all the Repton games. There are a massive thirty levels of play. In each level you have to build up a jigsaw puzzle of a famous personality or place by collecting the pieces scattered around.

However, it's not quite that easy! You have to carefully manoeuvre your way around using various Conveyers and Transporters, and a lot of cunning strategy. You collect the Gems as you move around, whilst dodging the deadly Androids, but what do you do with the Towers, Trees, Grass, Mushrooms and Holes?

"Repton 4 is challenging, good value for money and well graded. What more can I say?"
...Acorn Computing (Jan. 93)

£24.95 (inc VAT)

PLAY IT AGAIN SAM 1




Four top quality, classic games...
...for the price of one!

Conqueror – The classic and highly realistic tank simulation game. Control up to 16 German, American or Russian tanks from World War 2. Arcade, Attrition or Strategy games.

Rotor – The widely praised strategy and action game. Manoeuvre the Rotor in 18 deadly missions into enemy fortresses. Destroy their defences as you steal ammunition.

No Excuses – Fifty levels of nerve-tingling excitement as you obliterate the grotesque aliens. Plus an easy-to-use designer to produce your own fiendish levels.

Hostages – Commando action and strategic planning as you rescue the hostages from the besieged Embassy. Realistic graphics and animation.

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SUPERIOR GOLF



The complete golfing game for 1 to 4 players, designed exclusively for the ARCHIMEDES. Realistic gameplay with a choice of six courses (St Andrews, The Belfry, Victoria and three Sea Palms courses), plus Driving Range and Practice Green. Full feature hole and course design and editing facilities.

£19.95 (inc VAT)

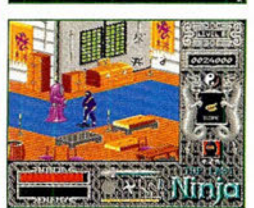
ZARCH



David Braben, co-author of ELITE, has harnessed the speed and performance of the ARCHIMEDES to create a programming masterpiece. You control a hoverplane, equipped with a laser cannon, smart bombs and homing missiles, over a massive 3-dimensional landscape, with realistic area shading and accurate perspectives.

£19.95 (inc VAT)

THE LAST NINJA



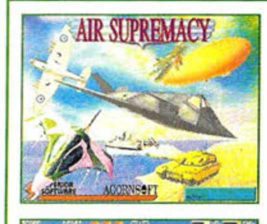
You must use swords, nunchakus and shiraken stars and solve many devious puzzles in over 140 action-packed screens. From the dangerous wastelands and magnificent gardens, to the direst dungeons and the final confrontation in the Inner Sanctum of the Shogun's palace.
You cannot fail...you are The Last Ninja.

A graphically brilliant conversion, using the full screen and 256 colours, of one of the most popular and highly rated games ever produced for home computers.

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...Micro User (Aug. 92)

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...BBC Acorn User (Dec. 91)

"The ultimate dogfighting game - will take weeks of intensive play to complete - sinks its hooks into you and doesn't let go."
...Archimedes World (Dec. 91)

£24.95 (inc VAT)

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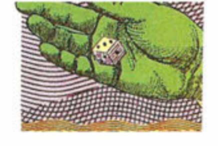


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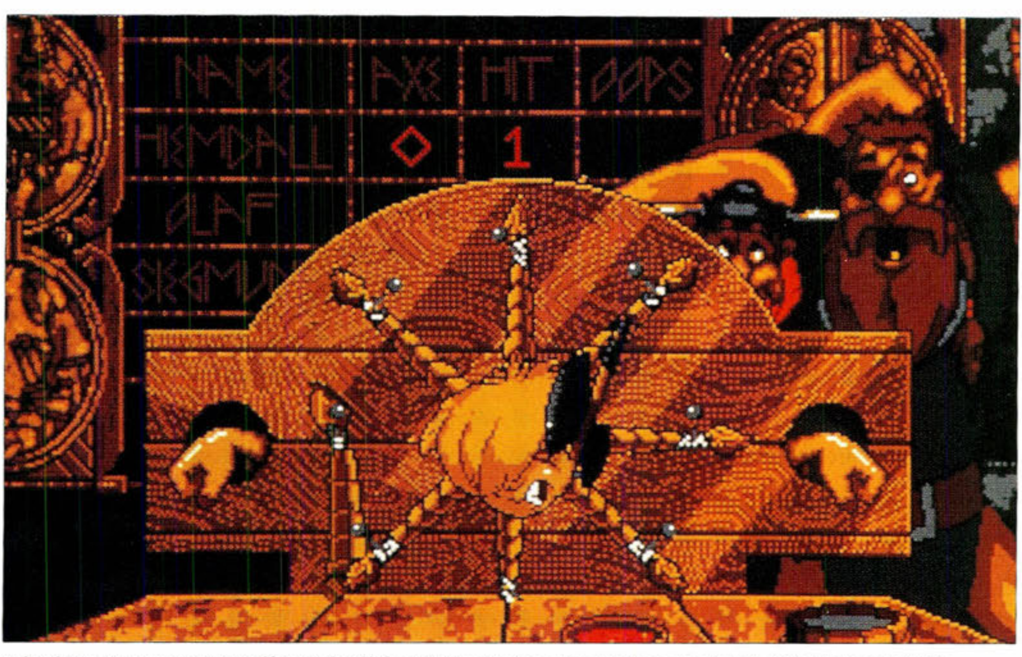
GAME SHOW

It is time to do some *Hard Drivin'* round the Acorn circuits. Games fans will know the arcade car game well, as it was easily the most popular machine a few years ago.

The game was ported onto many computer formats too, but nothing for the Acorn range. Now The Fourth Dimension is test driving its latest game, provisionally titled *Stunt Driver*.

The basics will be the same: 3D graphics, a view from inside the car and so on, and many of the stunts will be familiar. In *Hard Drivin'*, drivers revved a rally car round a stunt or race track, aiming to beat the clock, performing jumps, loop-the-loops and the rest.

There are two main differences though. An excellent bonus for *Stunt Driver* will be a two-player feature so a friend can race alongside you round the stunt track – and if that's not considered dangerous I'm a banana. The other difference is rather bizarre. As if your maniac friend trying to bump you off half way round the loop-the-loop wasn't bad enough, you will have to avoid humongous mallets which pop out of the ground and try to squash your car. And that's only one of the totally-wired obstacles you will meet. Watch out for this game.



Urk! That was a near miss! Half an inch off the target with the axe and the game is lost. This short and simple pastime is a sub-game to be found in the Viking roleplaying game Heimdall from Krisalis Software. It is used to determine character attributes before the main game is played and there are two other similar sub-games.

Enthusiastic new software house TBA Software, which launched itself with the abysmal Breakout-clone *Dragonball*, and followed with the excellent shoot-em-up maze game *Axis*, has two more games in the pipeline. The first is *Psycho Squadron*, a vertically-scrolling shoot-em-up with an extended battle area and bonus rounds. As well as the usual power-ups, pilots can collect extra wingships to hype up their fire power, and there is also a training programme for new pilots.

Meanwhile, levitation is the name of the game in TBA's other game, *Free Run*, which will be released under the Powerstation label. Free Runners pilot small anti-gravity skimmers at breakneck speeds around race tracks on several different planets in pursuit of the System Championship prize. The game features RotaVision, which is TBA's 3D distortion routine to allow a first-person view of the massive sprite-based race tracks. Like *Axis*, *Free Run* includes an enhanced version for computers fitted with the faster processor chip, Arm3, and also for the Arm250. Both *Psycho Squadron* and *Free Run* will be available mid-summer.

Gamer's upgrade

The growing zeal of Acorn users for joysticks and joystick utilities has gone to an extreme in which the joysticks themselves are now growing out of the computer (so to speak). The latest joystick interface caters for four separate sticks but first you have to solder it directly onto the computer's internal PCB board. Eeek! Sounds dodgy. But, says Matt Black, the company selling Gamer's Upgrade (for £27.99 + £2 p+p): 'It sounds hard but it isn't in practice. It is very simple and straightforward.'

The advantage of this DIY method is that the computer's expansion ports are kept vacant and so the joystick interface, which supports two independent fire buttons, becomes a permanent fixture, without switching and plugging. However, Acorn Computers has responded cautiously saying users who solder anything inside their computer would almost certainly invalidate their warranty.

Winners

There were bagfuls of entries to the *Battle Chess* competition in the May issue but only five could win a copy of the sadistically-violent 3D chess game from Krisalis Software.

They are Adrian Emery from Sandy; Chris Bell from Walsall; Robert Newman from Cambridge; Matthew Kearns from Shepton Mallet; and DJ Collett from Yelverton, Devon.

The correct answers were as follows: 1. Nigel Short, 2. John Cleese (*not* Michael Palin, he isn't as funny), 3. White square.

News nugget

Within the next few weeks, high street chainstores such as Boots, John Menzies, Tandy and Dixons will find themselves swamped with Acorn games. A proliferation of popular titles such as *Lemmings* and *Zool* is set to revolutionise the sale of Acorn games, which up till now has been dominated almost entirely by mail order.

The reason is that Centre Soft, the massive distributor for Amiga software, which also owns US Gold, is dipping its toe into the Acorn market and the result will be that Acorn games are as easy to come by as Sonic the Hedgehog.

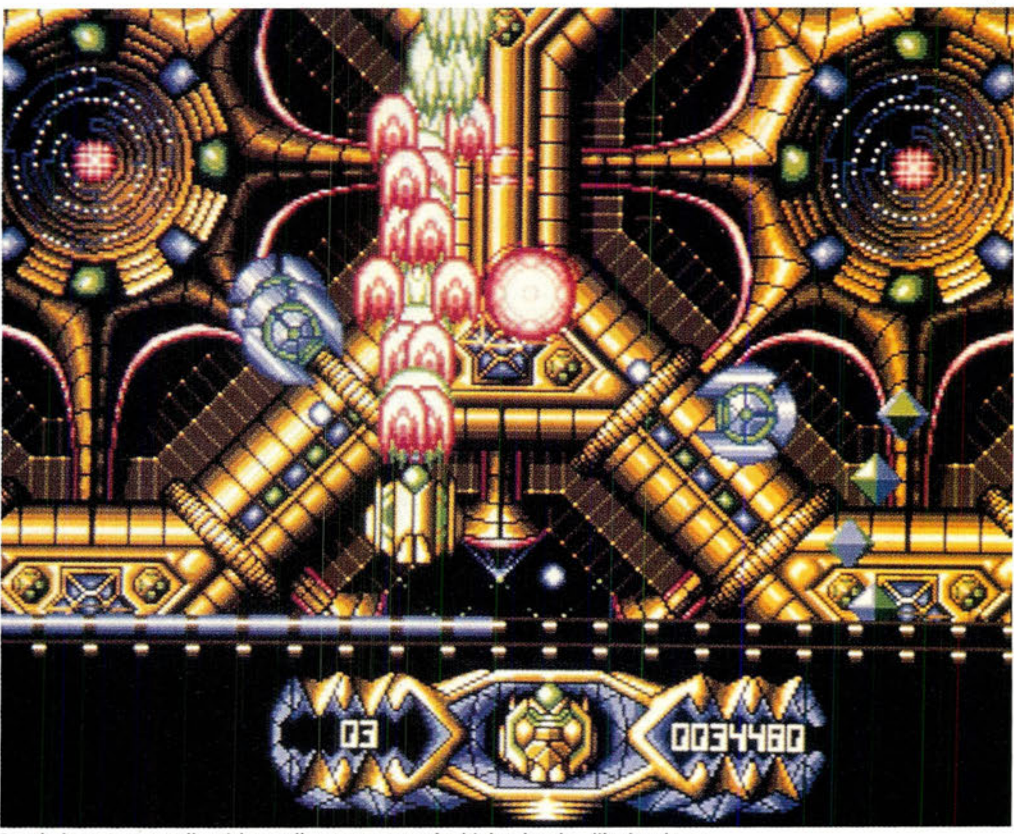
Quark preview

Supplier: Oregan
Tel: 021-353 6044
Machines: 32-bit
Price: £24.95

Quark is a shoot-em-up that is so new they haven't even finished it yet. However, Oregan sent us a copy to evaluate that is so close to the final version that there are only one or two minor differences. More about those later.

Although they have a specification superior to virtually all their rivals, Acorn machines have always been thin on the ground when it comes to decent games. A relatively recent move by Acorn into the European market has seen a few games from across the Channel making their way onto screens in Britain.

Aldebaran showed what is possible on 32-bit machines, so will *Quark* (from France incidentally) make a similar mark? We were lucky enough to get hold of a preview copy to see the game developing.



Quark doesn't get really tricky until you get onto the higher levels... like level two

Oregan is one of the new games houses producing software and its latest release looks set to satisfy all those fans of the 'shoot now, ask questions later' genre. *Quark* is a shoot-em-up in the truest sense of the word; things fly down the screen and you shoot up at them. Nothing could be simpler.

The game is big and therefore comes on two discs. The main bulk of the disc storage is used to hold level data and so the program itself will work quite comfortably on a standard 1Mb computer. Loading *Quark* is simple: just a case of double-clicking on the game icon as usual.

Once loaded, you are presented with a suitably-drawn title screen, after which you move on to a set of two control panels. From here you can select either a one- or two-player game and what sort of ship you wish to control, plus the types of shields you wish your ship to have.

In both cases, selection is made by moving a rather ghoulish-looking hand over the required panel and pressing one of the bony fingers. All control is via two sets of predefined keys (one for each player) rather than the mouse, which is a strange choice as the hand is actually a pointer. These keys are used for controlling the ships and can be redefined to suit each player.

There are five ships to choose from, each of which has its own particular characteristics. The main difference between the ships is the way in which each one fires at the enemy. The first ship, for example, fires large splodges, making it easy to hit the smallest of nasties. Another ship has homing missiles which track any alien foolish enough to stray too near.

The game is made up of six levels, each of which has its own particular set of nasties. On early levels (well... level one) dodging projectiles while trying to shoot down the extra-terrestrials is relatively easy. They are all quite small and move around in a predictable way. Later on in the game (level two onwards) larger nasties appear from all sides of the screen and their shooting patterns are precise, to say the least.

If you are fortunate to pick off one of the larger aliens, a bonus token appears which can be picked up for extra points, or for enhancements to your ship. Extra fire power, repairs to your ship and increased manoeuvrability are all possible if you collect the right tokens. Accumulating 'extra fire power' tokens is especially satisfying as the more you get, the easier it is to blast away the larger aliens.

The main part of the game is in what appears to be a 256-colour mode, although because it's overscanned (the picture reaches right to the edges of the screen), it's hard to tell. Good use is made of dithering colours to give the rolling landscape a sense of depth and the employment of highlighting adds to the overall effect. The first stage is set in a graphically-simple lunar terrain but further levels take you over Aztec-style temples and futuristic moonbases.

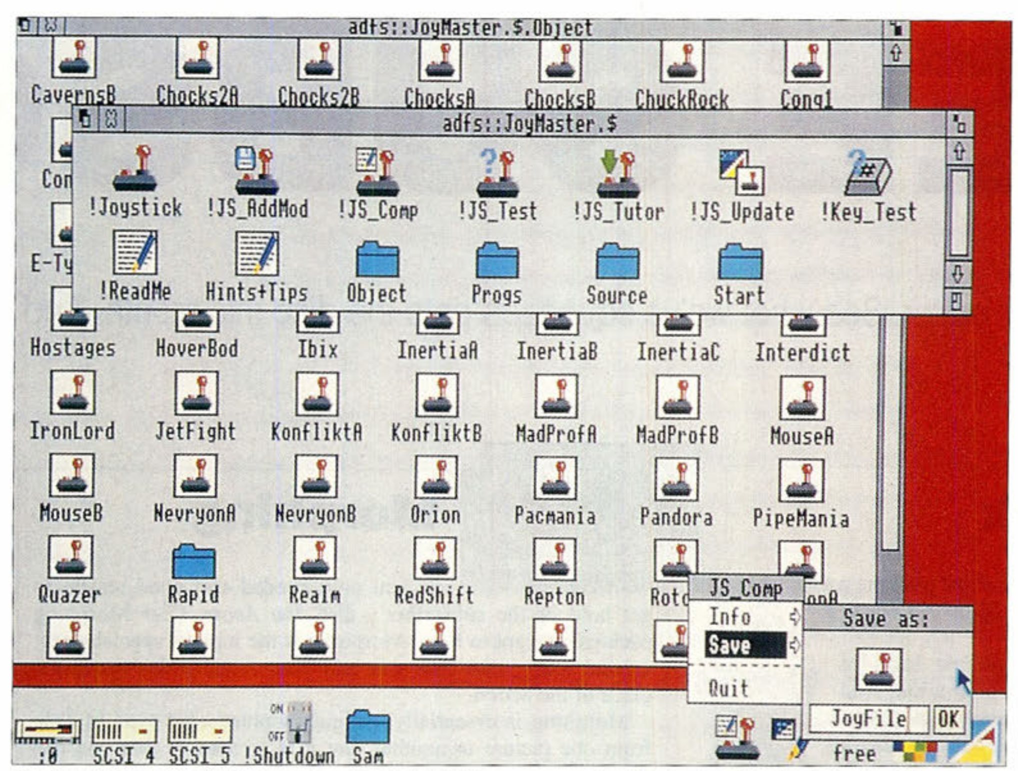
Unlike some games of this type, there is nothing on the ground that you can actually bump into. This is particularly useful as avoiding the onslaught of aliens on later levels is a full-time job in itself. There are gun-bases of sorts (more like stationary aliens really) although these can be destroyed quite quickly, before they inflict any permanent damage.

In keeping with a game of this sort, the sonics are excellent. Explosions sound especially good when played through a nice big hi-fi. Other bangs, pops and whistles give the game added depth and bits of sampled speech crop up occasionally to add to the generally manic atmosphere. The finished version of *Quark* promises to have even more in the noise department. Also lacking in this pre-release version and to be included in the full game are: a redefine-keys option, end of level nasties and – thankfully – a pause button.

Apart from the fiddly controls when selecting your ship, I can find nothing to fault *Quark*. It's certainly not the most original of games but as the saying goes: 'If it ain't broke, don't fix it.'

If you fancy a taster, look no further. You will find a demo of *Quark* on this month's subscriber's disc

Sam Greenhill



The A3010 Joymaster fooling your machine into thinking you are using the keyboard instead of a joystick

A3010 Joymaster

Supplier: The Leading Edge
Tel: (0532) 436300
Machines: 32-bit
Price: £19.99

The Acorn A3010 is a great games computer – after all it's got two joystick ports right? Not quite. Joystick ports they may be but the trouble is that most games written *before* the A3010 don't work with them. And, unfortunately, that means most games.

Now The Leading Edge claims to have the answer to your problems. The name of this solution? The *A3010 Joymaster*.

The Leading Edge has a hardware joystick interface that has been around for a good number of years now but it has recently been upgraded so it will function correctly with new style, bi-directional printer ports (such as the A5000, in fact).

Now the same style software has been modified to help A3010 owners, who already have the joystick ports built in but need some software to make it all happen.

The *A3010 JoyMaster* package consists of one disc and one manual. The disc comes with joystick files for nearly 60 games but if, by remote chance, the one that you want to play isn't on the list, there are no less than six applications which will help you to build a module to your own specification.

The software works by detecting joystick movements and turning them into key presses so the computer thinks the player is using the keyboard. For example, moving the joystick left might 'press' Z. Practically all games are totally oblivious to the fact that this Z did not actually come from the keyboard.

The simplest way to program the joystick is to use *JS_Tutor*. This allows simple mappings between joystick movements and key presses to be set up.

For the more adventurous you can use *JS_Comp*. This compiles a module from a text file. The language used allows complex tasks to be set up; one, for instance, allows direction movements to generate different keys if the fire button is held down.

Another feature of the package is that mouse movement and button state can be simulated, allowing you to control your desktop from the joystick if you so desire.

Two internal flags are also available which can be used for all sorts of purposes such as simulating rapid fire. An additional movement, the 'stir', is available to both *JS_Tutor* and *JS_Comp*. This is generated by rotating the joystick clockwise – the sensitivity of this can be adjusted to make it faster or slower – and is remarkably handy for selecting weapons or toggling maps on or off.

If all this sounds a little daunting, the best thing to do is to take a look at one of the examples for a similar game and modify the source file as required for the game that you are going to use.

You are also given a lot of help including the module automatically into games. This can be quite tricky because of protected discs but a number of different options are available and these seem to circumnavigate most of the problems.

In conclusion, there's not much to say really – it works. Many A3010 games players will jump at the chance to be able to use joystick control on all the old games.

The *A3010 JoyMaster* is a high quality product. Better still, the tutoring programs and the programming language make it an exceedingly versatile utility. This is surely a must for any of you games nuts out there.

Dave Lawrence

Cheats

Zool



Trendy Zool is Sonic without the spikes, he's hip, he's happening and he's in trouble, stuck on a silly planet made from sweets (not so bad?) and all he can do is escape to a world of music where thumping great notes annoy him and violins shoot their bows.

After that it just gets worse for poor Zool, star of the first of several blockbuster games from mega-games house Gremlin Graphics.

Zool fan Rupert Revill from Sheffield has some ninja-tips. On level 1.1 there is a hidden Polo bonus to be found by punching out the bottom section of the first sheer wall Zool comes to after the second Hit button. Keep punching your way through to make a new passageway.

Try the same thing on level 1.3 at the first sheer wall you come to (wait until the time gets to below 50) and Zool will find some extra lives, bonuses galore and an alternative exit.

Pipemania



Flooozze! It ooozzes, it's yukky, slimy, sticky and it's leaking. Plumber-to-the-rescu is the theme in the classic arcade strategy game *Pipemania*, recently sold on a compilation disc from Krisalis Software.

Your task is to pipe it, non-drip style, round the screen, making the pipe as long as possible before the flooze catches up. Tricky, very tricky. But not quite so tough if you know about the built-in cheats.

Julie King from Sudbury, Suffolk does, and she's sent word of how to get them. You need to be on the keys-redefining screen. Then you use the mouse to point and click at the letters on the keyboard diagram, in order to type these words. You follow this up with the RETURN key on the diagram.

Try ROGUES, CREDITS, and VJRSYD (the letters to the right of 'cheats') for three different hidden routines. The cheats are all pretty obvious except 'Pipe Rotation': use the player two keys. Good luck and, more to the point, good plumbing.

FREE SUBSC

Ever bigger, ever better. See what we've squeezed onto the disc this month. And if you're

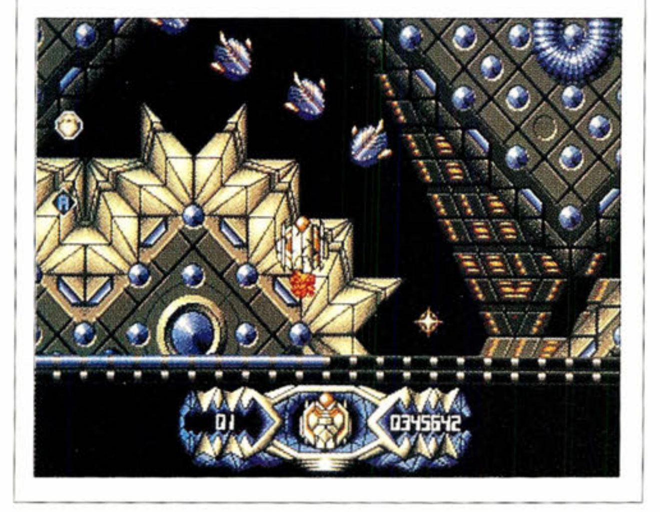
Quark

Read the review and play the game, with this exclusive demo of Oregan's fantastic new shoot-em-up *Quark*.

You can play a snippet of the first level of *Quark*, more than enough to blow your mind. And you can choose to play with a friend in two-player mode, you where you blow the hell out of numerous nasties, side by side. Collecting bonuses, murdering not-so-defenceless aliens: it's all in a day's work in *Quark*.

There's also a very special offer open to *Acorn User* subscribers; if you order *Quark* direct from Oregan, you will be offered the choice of a free gift worth £20.

So what are you waiting for? Get into the best shoot-em-up this side of the 32-bit barrier.



Morphing

If you only needed one good reason to get hold of the subscriber's disc, the *Acorn User* Morphing package has got to be it. Morphing is the hippest special effect around today, and now you and your Archimedes can get a piece of the action.

Morphing is essentially a highly-sophisticated type of fade from one picture to another, but it is so smooth that you can really achieve some amazing animations.

The example we couldn't resist is on the disc: Stevie Nicks morphing into Miss Piggy. Looking at the picture below hardly does justice to the way that Stevie's nostrils flare into Miss Piggy's perfectly-formed snout, but believe us when we say it's highly amusing.

Morphing works by combining three well-known effects, inbetweening, image distortion and digital fading to create smooth conversion from one picture to another. The disc contains complete sprites and morph data for you to experiment with, along with full instructions on how to use the three morphing applications: *Morph*, *Convert* and *Animator*. All you need now to create mind-bending and body-bending animations is artistic flair and a little bit of time.



Basic

Deep down, everyone wants to learn to program so they get the best from their machine. This month sees the launch of a new series which promises to teach Basic to everyone who has an Acorn.

Of course, the subscriber's disc contains all the programs which are mentioned in the series, but these are strictly for reference: if you really want to learn the ins and outs of programming, type them in yourself. Seasoned yellow pages fans will understand the challenge of typing in listings and making them work.

Possibly the only article ever devised where having the subscriber's disc could be a disadvantage...

*INFO

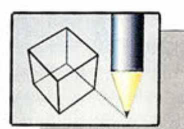
Surely the most disgusting desktop application ever devised has to be Cockroach in this month's *INFO. For your delectation we present the desktop demo to end all desktop demos: your very own family of friendly cockroaches which scurry around the backdrop and hide under windows.

And that's not all. There's *Fruit*, the one-line fruit machine; *OnTime*, a hack to display the time while the desktop is initialising; *Fans*, which displays some er... fans; *Engine*, your definitive guide to the insides of the four-stroke internal combustion engine; and *Dismount*, to make mounting and dismounting discs a breeze. And lots more.



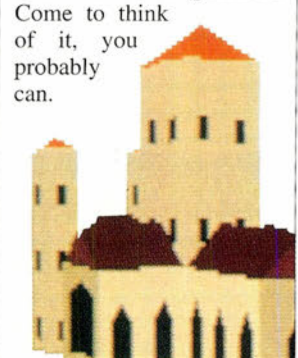
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3D

Cathedrals, houses and skyscrapers all make up the modern city, and our series on 3D Graphics has 'em all. Don't you wish architects had tools like this? See if you can do a better job than the town planners. Come to think of it, you probably can.

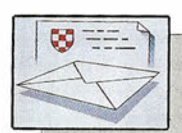




Bio

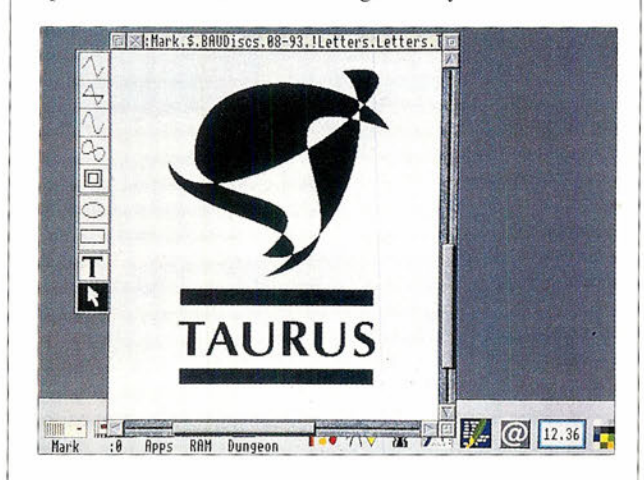
Since its inception in February of this year, modules for our general-purpose *Bio* application have been flooding in. In response to the flood, the authors have added a host of new features to the original *Bio* core, including sprite output and interactive help.

The modules on the disc include HexDump (creates hexadecimal file dumps), 3DGraph (draws 3D graphs), SpriteSort (sorts sprites within sprite files), DrawSprs (pulls sprites out of *Draw* files), VATCalc (calculates VAT) and WordCount (counts words in files) and much more.



Letterheads

Designing your own professional-looking stationery can make a huge difference to your correspondence. *Draw* is an excellent tool for this, and all Rob Miller's designs are available on the disc. Compliment slips, business cards, letters and logos – they're all here.





HANDS ON
Practical advice and techniques for your machine
THIS MONTH:
● Morphing
● Basic programming tutorial
● 3D graphics
● Questions and answers
● Star Info
● Hints and tips
● Program listings
IOC
VIDC
MEMC

Hands On

Welcome to Hands On, the section that boldly goes where no hacker has been before. I'm serious; just wait till you see what we've got in store for you this month.

The star attraction is a new application from graphics genius Robin Barnes, who brought us his rendering package in the June issue. You've seen morphing on the television, and with *Acorn User's Morph* package you can warp your mother-in-law into a gorilla in front of your very eyes. As Robin says: 'I didn't realise quite how addictive morphing can be.' You have been warned.

Another new offering is the first part in our series on learning to program in Basic V. Every 32-bit Acorn machine, be it a lowly A305 or a lightning-fast A540, comes with BBC Basic: the series will teach you how to use this simple but powerful language so you can create your own programming masterpieces. If you want to contribute to the magazine but you can't program, or you want to get to know the insides of your machine in more depth, now you can.

Our ever-popular application *Bio* has a few useful additions made to it, as well as more modules to use with it. The enhancements include the ability to output to a window and save the results as a sprite, and support for Acorn's *Help* application. The new modules include a 3D graph generator, a module to sort sprites in sprite files into alphabetical or numerical order, and (on the disc) a Vat calculator. Keep sending in your own modules: there'll be more *Bio* extensions on offer next month.

The third instalment in our series on 3D Graphics takes a look at polygon clipping to speed up the display of our virtual town, and how to cope with memory management for large numbers of objects.

Along with Questions and Answers, Hints and Tips and the ubiquitous *INFO, it's a packed month here at Hands On. Live long and prosper.

Mark Moxon
Technical Editor

Morph for less

From Terminator 2 to pop promos, morphing is the special effect of the moment and costs millions... On the other hand you can get it free on our disc. Robin Barnes explains



Morphing has become the trendiest film special effect in a long time. You see it everywhere: pop videos, television adverts, Hollywood films, even posters.

Morphing converts one image into another, smoothly and seamlessly. The BBC recently used it in an advert in which famous BBC stars morphed from one to another, while sitting across a table from Griff Rhys-Jones. Possibly the most famous use of the technique was in *Terminator 2*, where the evil terminator robot morphs between its liquid metal form and normal human appearance. That film cost millions to make, due to the cost of the hardware necessary to calculate the transformation from one person to another.

Morphing applications have been available on platforms such as the Mac for some time, but there has never been one released for Acorn machines... until now. Roll back the curtains. *Acorn User* is proud to present the first complete morphing package for the Archimedes, available only on the subscriber's disc.

How does morphing work?

Morphing, as its name suggests, is the metamorphosis of one object into another: the initial image into the final image. The method works by combining three well-known techniques used in computer graphics: inbetweening, image distortion and digital fade.

Inbetweening is perhaps one of the oldest recognized computer animation techniques. By describing the start and end positions of a shape, the computer can interpolate between them to produce a smooth animation. This method is used to interpolate between two wire-frame objects in *Draw*, for example, and has been implemented on home computers for some time.

Image distortion involves wrapping all or part of a picture onto a different shape by calculating where each pixel in the initial image appears in the final image. This technique does require quite a lot of processor power, so sprite distortion software has only really been practical on the latest breed of home computers. A good

example of image distortion is the *Distort* program from June's *INFO, where sprites could be mapped onto a sphere.

Finally, the digital fade fades from one image to another by interpolating between the colours of corresponding pixels in the initial and final image. So, if a pixel in the first image was black and the corresponding pixel in the last was white, the fade changes the colour of that pixel from black, through the scales of grey, to white.

Morphing puts these three effects together in a very simple and logical way. The first step is to describe the shape and specific features of the initial and final images; this is usually done by defining a wire-frame mesh or a grid. Inbetweening the two meshes (which are wire-frame objects, after all) will then produce a smooth transformation of one mesh to another.

Imagine that we need to calculate the image at a certain intermediate stage during the morph. Each mesh element encloses a section of the image, and the position of each pixel within the section at a certain stage can be found by image distortion. By finding which mesh element contains a specific pixel, and by finding the position of that element in the initial and final frames, it is a simple matter of mapping to find the corresponding pixel in the initial and final frames. Having found the position and the colour of the two pixels that contribute to the intermediate frame, the colour of the pixel can be found by using a digital fade.

This process is repeated for each intermediate frame and each pixel in the image to produce the final morph. Animating these frames will then produce the complete animation.

The morphing suite

The system is made up of three applications: *Morph*, *Convert* and *Animate*. *Morph* is a full multi-tasking desktop application which takes two sprites and morphs between the two according to a mesh. You define the position and shape of the mesh for initial and final sprites; anyone familiar with *Draw* will have no problems defining meshes in *Morph*. Meshes can be saved to disc, and a full example consisting of initial and final sprites (and a mesh) is on the disc.

Morph creates a sequence of sprite files (the intermediate stages of the morph) ready for *Convert*. *Convert* takes these and creates a special movie file, which can be played in a desktop window by *Animator*. Movie files are sprites stored in a specially-compressed format; the compression algorithm balances the needs for fast frame rate and high compression ratio.

Depending on the complexity of the image the routine manages a compression of 30 to 40 per cent of the original size and expansion rates of 1Mb per second on an Arm2. In real terms this means a 320 x 128, 256-colour sprite can be displayed at 25 frames a second; each second of animation occupies about 400K of memory.

Get morphing

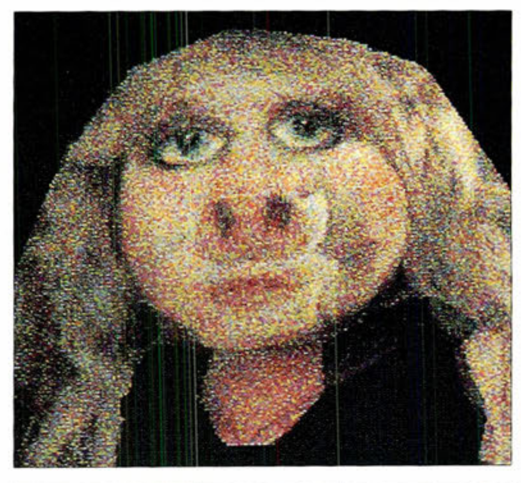
Until I'd finished the program, I didn't realise how addictive morphing could be. Using a digitiser, or even a hand scanner, anyone can be morphed into their favourite shape. If you create any really impressive morphs, send them to the usual editorial address.



Our initial image is of silver-tonsiled songstress Stevie Nicks. Watch as, before your eyes, she becomes someone quite different...



...as we use a trio of effects: inbetweening, image distortion and digital fade. The frames of the morph are smoothed together...



...the morph consisting of a series of sprite files run together in sequence to produce a seamless and startling transformation...



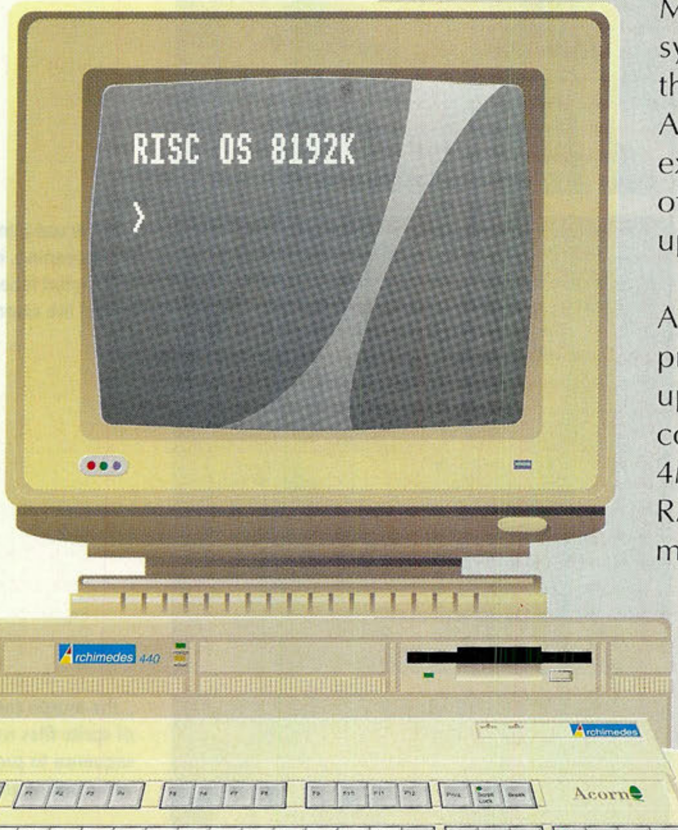
...until she emerges as Kermit's girlfriend. Well, can you see where Stevie Nicks ends and Miss Piggy begins?

A300

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Back to basics

What is a program? How do you type it in? And how do you save it? Mark Moxon starts his tutorial in Basic programming with some basic concepts

Welcome to the first part of this series on learning to program in BBC Basic V, the language that comes free with every 32-bit Acorn machine. Although Basic is regarded as a rather slow and primitive language on other platforms, Acorn's implementation is very flexible, very fast, and is ideally suited to those learning to program.

Why should you want to learn to program? Well, there are a number of very good reasons. You can write programs for your own use; you can read and understand other people's programs, and change them if you want; you'll understand more about how the machine works, and how to get the most from it; and most of all, programming is really satisfying. Ask any hacker: the moment when you finally get a program to work is great. So it's on with the show.

First steps

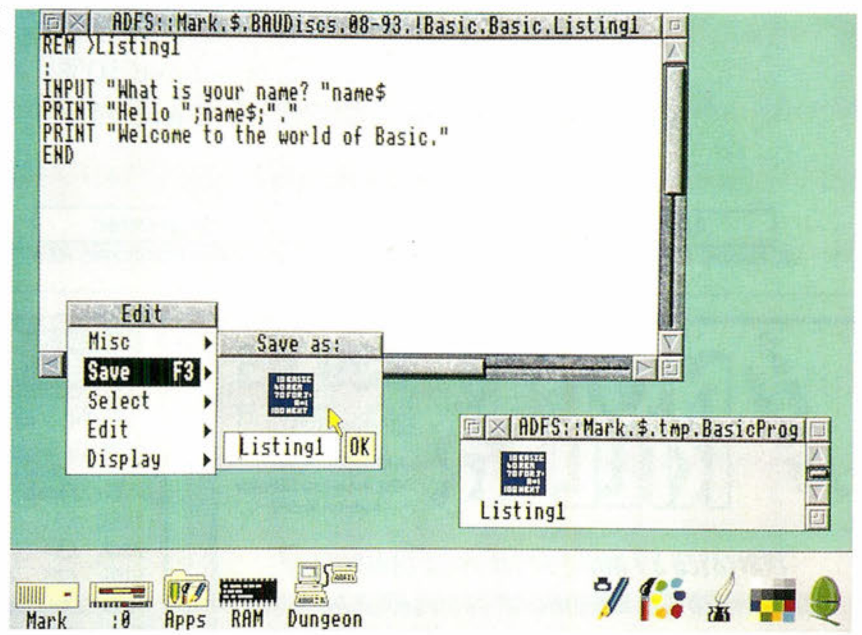
In this article I'm going to cover a few basic concepts (excuse the pun – go on, *you* think of another way of saying 'basic concepts'). First off is the age-old question 'what is a program?' Next we'll look at a couple of example programs just to get you in the mood. Then I'll talk about how to type the programs in, how to save and run them, and how to track down any typing errors you may have made, followed by a slightly longer program with a line-by-line description. Here we go...

The concept of a program is very simple: it's just a list of commands which you give to the computer. Imagine giving directions to your house to a friend over the phone: 'turn left at the lights', 'go over the next roundabout' and so on. A program is just like a list of instructions, but the instructions aren't in English, they're in Basic. When you run the program, the computer follows the steps a line at a time until it reaches the end of the program. Then it stops. Easy.

Let's jump straight in at the deep end and look at an example program. For those of you who have read books on Basic, or who have followed other series, please don't groan when you see my examples. No doubt you will have seen them before, but that's only because the oldies are goldies. I make absolutely no apologies for my taste here.

Listing 1 is a very short program. If you know anything about Basic then you'll notice that there's something missing: the line numbers (have a look at the listings in the yellow pages to spot the difference). In Basic programs each line has a unique number, but in these days of enlightened programming practice the line number is regarded as an irrelevance, so in this series I'm going to ignore them totally.

The reason for leaving out line numbers is that you don't need them: they're a throwback from earlier days when you needed to refer to lines within a program, days which are thankfully gone. Seasoned programmers will know all about the line number debate, and this approach is the best possible way to ensure that good programming habits are learned. If you don't know what I'm talking about, it doesn't matter: when you type in programs from the yellow pages, type in the line numbers, but if they're for this series, don't.



Typing Listing 1 into Edit

Don't worry if you haven't got a clue what Listing 1 does: I'm only trying to scare you off at an early stage.

Typing programs in

Great, so we've got a program. But how do you type it in? And what happens next? Well, there are a number of editors which can be used to create Basic programs: Risc OS 3 *Edit*, *DeskEdit 2*, *DBEdit*, *StrongEd II*, *Zap* and *BasicEdit* to name but a few. I'm going to be concentrating on using Risc OS 3 *Edit* as it comes free with your system, but if you feel happier with another editor, fine. Do note that Risc OS 2 *Edit* can't edit Basic programs, which is another reason to upgrade (as if you needed one).

Now to type in Listing 1. Load *Edit* onto the iconbar, and press Menu over the icon. Move into the Create submenu and click on Basic; this opens up a normal *Edit* window, but ensures that what you are creating is a Basic program, rather than a straight text file. Get used to this window: you'll be seeing a lot of it.

Typing in the program is a breeze. Simply type each line as it is listed, and press RETURN at

Listing 1

```
REM >Listing1¶
:¶
INPUT "What is your name?
"name$¶
PRINT "Hello ";name$;"."¶
PRINT "Welcome to the wor
ld of Basic."¶
END¶
```



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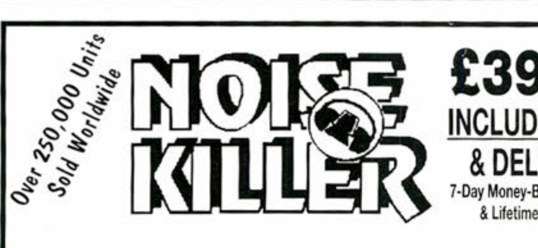
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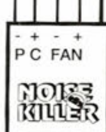


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the end of each line. As we have decided to ignore line numbers, it's a bit tricky to tell where the end of each line is, so I've put the ¶ character to show you where to press RETURN. Don't try to enter a ¶ character: just press RETURN.

When you've finished typing in the program, save it just as you would save a text file, by pressing F3 or using the Save option from the menu. That's all there is to it; you've created a Basic program.

Problems, problems

You can run your program by double-clicking on your Basic file. Hopefully a little screen will appear with a prompt for you to enter your name: do so and press RETURN. The program displays a friendly greeting, and a message appears inviting you to press the space bar, or click a mouse button. This is what happens with programs that do not multi-task: they take over the machine until they have finished executing, then you have to click the mouse to return to the desktop. The programs in this series will not be multi-tasking desktop applications: the theory behind writing multi-tasking programs is complex and books on the subject require prior knowledge of Basic programming.

If you've managed to mistype anything in the program, then the above may not happen. Say you typed `PRIT` instead of `PRINT` in the fourth line; running the program would still ask you for your name, but would simply display 'Mistake', followed by the 'click mouse' prompt. Try it and see. Tracking down errors in small programs like this example is not too tricky, but imagine a program with hundreds of lines; an error like 'Mistake' is hardly helpful. Enter Listing 2.

Listing 2 includes one extra line, starting with `ON ERROR`, and it has a deliberate error in the fifth line. When you type in this program, take very special care to get the `ON ERROR` line right, as a mistake here could cause your machine to hang – so make sure you haven't got any unsaved work before you run the program.

When you run the program, type in your name, and the error message shown is 'Mistake at line 5'. This may not seem much more helpful than just 'Mistake', but the line number allows you to pinpoint the mistake. To correct the error, use the Goto function in *Edit* to go to line 5 (via the menu or by pressing F5) and the caret will go to the incorrect line. Change `PRIT` to `PRINT`, and the program works fine. If the number in the error message isn't 5, make sure that the entry in the Line number increment submenu is 10.

This system enables you to track down typing errors. All the programs in this series will have the magic `ON ERROR` line, so it's worth adding a few of your own mistakes to the example programs and seeing if you can find them using F5. Trendy editors like *DBEdit* track errors and jump to the offending line automatically, but for those without, *Edit* is perfectly adequate.

I'll use this method of referring to specific lines in programs, so if I refer to the 143rd line, then to get there, press F5 and enter 143.

Line by line

Listing 3 is a slightly longer program with lots more commands to bemuse and amuse. Type it in and run it to display multiplication tables: hardly mind-bending, but not bad for the end of the first article, surely? Just so you get a general feel for how a program is executed, here's a quick breakdown of how this third program works, line by line.

❶ A `REM` statement. This does nothing at all: it just allows us to put little comments in the program (`REM` is short for remark). Here the comment is simply the program name. Don't worry about the > sign; it's another throwback from ancient days, but it's a convention to put a `REM` at the start of the program with the program name prefixed by a >.

❷ A colon. This also does nothing on its own, it's just here to space the program out a bit. Attractive, don't you think?

❸ A tough line, this one. It means 'if there is an error then report it, print the line number, and then terminate the program.' Obvious, really.

❹–❻ This is called a REPEAT-UNTIL loop. If you were able to describe programs in English rather than Basic, these lines would read: 'Get the user to type in a number, with the prompt "Which table would you like to see (1-12)?" and make sure that the number entered is between 1 and 12. If it isn't, ask again.' The middle line is indented to show that it is inside the loop, purely because it looks nice.

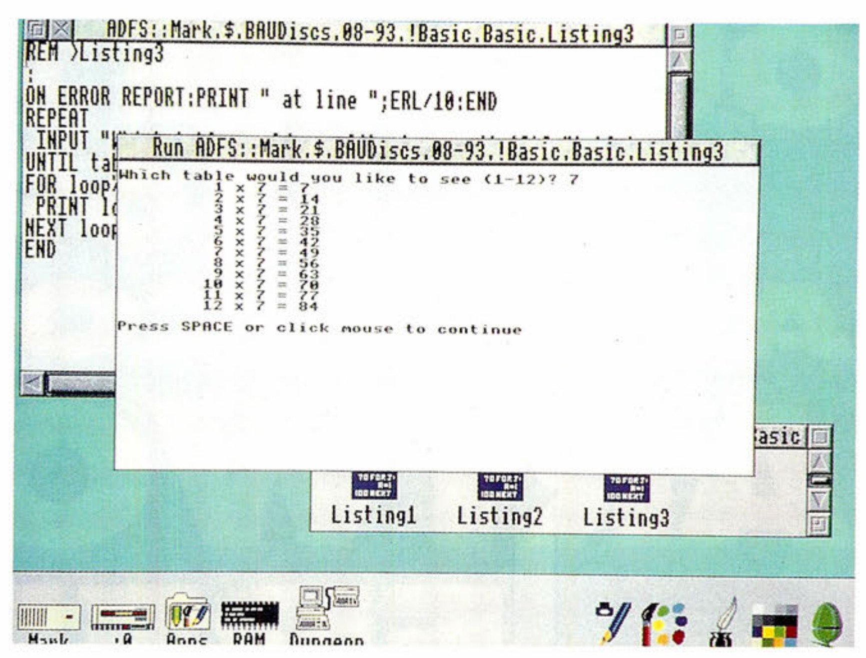
❼ This forms the start of what is called a FOR-NEXT loop. It means that we're about to execute the following lines (up to the NEXT statement in line 9) 12 times.

❽ This is the line that is executed 12 times. It prints up the number of the loop we're doing (which is from one and 12), a multiplication sign, the number the user typed in at the start, an equals sign, and finally the result of multiplying the loop number by the user's number. This, believe it or not, ends up looking like a multiplication table. Again this line is indented as it is inside a loop.

❾ This signifies the end of the loop.

❿ This signifies the end of the program.

Don't worry if the above makes no sense; after all, it makes the next instalment more of a challenge. Next month you'll actually start to learn to program in Basic: see you then.



What happens when you run Listing 3

Listing 2

```
REM >Listing2¶
:¶
ON ERROR REPORT:PRINT " a
t line ";ERL/10:END¶
INPUT "What is your name?
"name$¶
PRIT "Hello ";name$;"."¶
PRINT "Welcome to the wor
ld of Basic."¶
END¶
```

Listing 3

```
REM >Listing3¶
:¶
ON ERROR REPORT:PRINT " a
t line ";ERL/10:END¶
REPEAT¶
 INPUT "Which table would
you like to see (1-12)? "
table%¶
UNTIL table%>=1 AND table
%<=12¶
FOR loop%=1 TO 12¶
 PRINT loop%;" x ";table%
;" = ";loop%*table%¶
NEXT loop%¶
END¶
```

A new dimension

To beef up your 3D plotting routines, Dave Acton adds SWIs to the BAU3D module and looks in detail at the problems of clipping and managing a multitude of objects and surfaces

In last month's thrilling episode of 3D graphics for your Arc, we provided the first portion of source for the *BAU3D* module – a simple but speedy 3D scene plotting aid. This month we add some more SWIs to the module to replace our old Basic 3D plotting routines, and we also take a detailed look at the problems of clipping and managing a large collection of both objects and surfaces.

A heap is used to provide memory for storing and rendering 3D scenes. You have to tell *BAU3D* the address and size of memory it can use as a heap with the call:

```
SYS "BAU3D_HeapInit",addr,
size
```

Thereafter, should you need them, you can grab blocks of memory from the heap with the command:

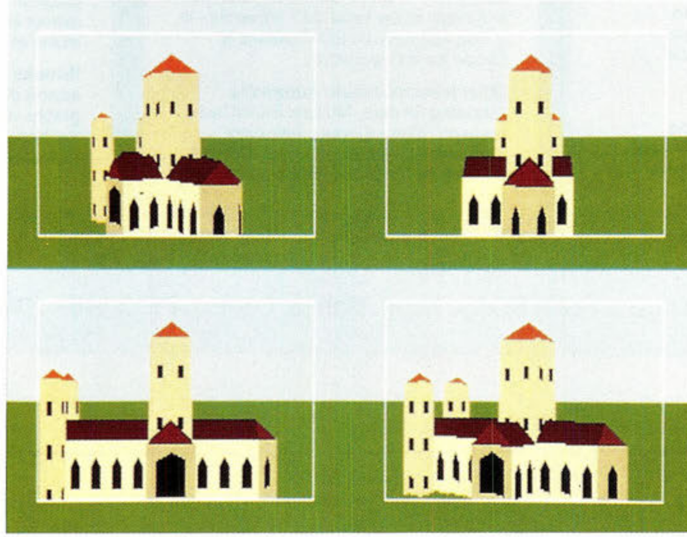
```
SYS "BAU3D_
Malloc",size TO
block
```

which will allocate size bytes starting at block. If the allocation fails, block will be zero. To free a block of memory that you no longer need, use:

```
SYS "BAU3D_Free"
,block
```

You can alter the size of a block with the command:

```
SYS "BAU3D_
Realloc",block,
change TO new
```


This month's example on the disc: the Objects.Cathedral file

where change is the number of extra bytes needed (negative if you want to shrink a block) and new is the (potentially) new location of the block. Note that a block may move if you extend it, so be sure to update any references to it.

The memory calls are provided for your convenience and are used internally by *BAU3D*. In practice you may only need to use SYS "BAU3D_HeapInit" prior to loading and rendering a scene.

This month on the disc you'll find a new example file called *Objects.Cathedral* to enter and save as a text file. Install *BAU3D* then run *3DDemo3* to display the scene.

The call to load a file is:

```
SYS "BAU3D_Load",
"filename",scale TO handle
```

and the handle returned should be noted and used to plot the picture. It is, in fact, the address of the object called 'world' which you should always define somewhere in your file.

As before, the *include:* command can be used to insert other files and it will be assumed these lie in the same directory. The *scale* parameter in r1 is the amount co-ordinates are scaled. Remember *BAU3D* expects positions in units of 1/10mm. So, if your file contains objects defined in centimetres, set scale to 100. If no scale is given, it is assumed co-ordinates are in metres and the factor is set to 10000.

To free up the memory used for a scene you no longer wish to plot, issue the call:

```
SYS "BAU3D_Lose",handle
```

To render a scene, use:

```
SYS "BAU3D_Render",handle,
viewxyz,viewang
```

and the scene will be displayed within the current graphics window. viewxyz should point to a 12-byte block of memory containing the *x*, *y* and *z* offsets to be added to the co-ordinates of objects plotted (one word each). viewang will point to another three-word block containing the angles by which the scene should be rotated about the *x*, *y* and *z* axes. *BAU3D* angles are always in the range 0-&10000 which correspond, in turn, to 0-360 degrees.

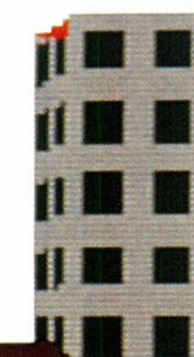
You will remember that the polygon plotting call SWI "BAU3D_Plot" takes various flags in r3. Bits 0 and 1 determine the format of colours and bit 2 is set if you want to use OS_Plot calls. So that you have control over these flags when rendering a scene, an extra call is supported:

```
SYS "BAU3D_WriteConfig",
flags,s,zplus
```

and the current settings may be read with:

```
SYS "BAU3D_ReadConfig" TO
flags,s,zplus
```

The value of flags is passed in r3 whenever the plot routine is called. The values of s and zplus specify how 'violent' perspective will be, and how much the picture will be scaled on-screen. Use the ReadConfig call to see the defaults.



Because scenes are constructed using a building block approach it makes sense to store them by allocating small blocks of memory and linking them with

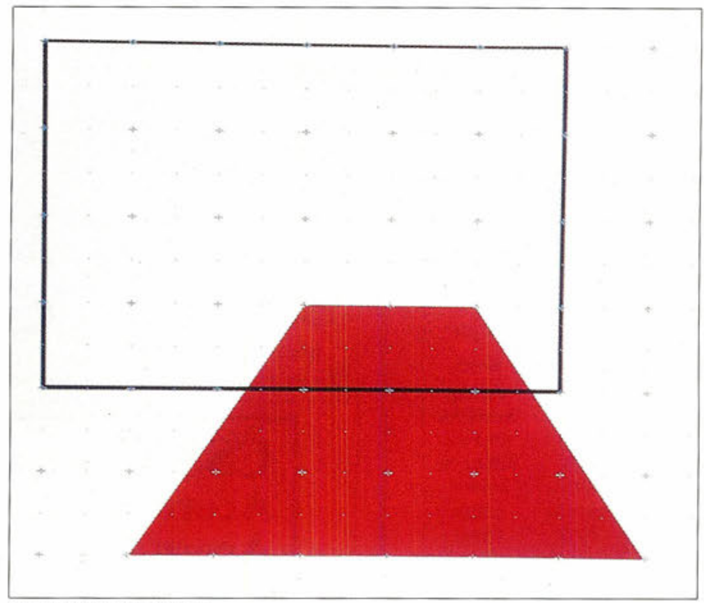
pointers. The idea here is to avoid duplication of co-ordinates. For example, your world might contain two identical houses. Although the co-ordinates and positions of the houses will need to be stored separately, it would be wasteful to duplicate every window and door. Instead, two *subobjects* are defined. These contain their own angles and positions and a pointer to the type of object they are. In this example, the pointers will both be the same and point to the house object.

The definition for the world takes the form of a tree. Within this tree there are three types of entity. The box below shows their formats. *Objects* are things like houses and are defined as a pointer to a name, and another to a list of *subobjects*. *Subobjects* are not objects in their own right but descriptions of the components of an object. For example, a house might have four *subobjects* in the form of walls, and another for the roof. A *subobject* contains a pointer to either an *object* or a *surface*. A *surface* is simply a list of co-ordinates and a colour which together describe a polygon. This is the most fundamental of building blocks.

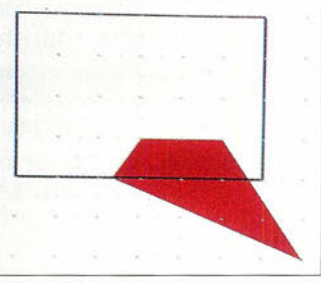
Bounding cubes

If you've ever played around with a *Draw* file you will probably be aware of the idea of a bounding box. This is simply the smallest box that totally encloses an object. In three dimensions the bounding box becomes a *bounding cube* and is just the smallest cube (or strictly speaking, parallelepiped, since it probably won't be exactly a cube) that encloses all components of an object.

Each *subobject* has its own bounding cube which comes in very handy when *clipping* in three dimensions. When standing in a 3D world, many objects will lie completely outside the *view pyramid*, which is simply that chunk of 3D space that you can see. By checking whether the bounding cube of an object is outside our view we eliminate it from calculations. We need to check the eight points that form the bounding cube – if all are invisible then we can ignore further details of the object.



The unclipped polygon



Sliding the first point onto the screen

Sliding to second to complete the clip

BAU3D structures

OBJECT	
0	-> name
4	-> list of sub-objects (or 0 if none)
SURFACE	
0	type (0 means continuation of surface list, 1 means start new list - set by the merge command for surface details)
4	colour
8	number of sides
12, 16, 20	first co-ordinate
24...	other co-ordinates
SUBOBJECT	
0	-> next subobject or 0 if no more
4	-> data, a pointer to a surface or an object
8	flags: bits 0-5 are used in clipping, bit 6 marks merged subobject and bit 7 is set if value at 4 points to a surface (clear if an object)
12, 16, 20	offset of subobject from origin of parent (x,y,z)
24, 28, 32	angle of subobject
36, 40, 44	co-ordinates of first vertex of bounding cube
48-128	other vertices of bounding cube

If the world is built up of successively larger components it will take little time to eliminate large invisible areas. Consider a town, defined as four quarter-areas, themselves defined as four sub-areas. It is likely that two or three quarters of the town can be discarded immediately since their bounding cubes are off-screen. Of the visible quarters, several sub-areas will be invisible, so we soon reduce objects to a manageable number.

The city demo *MakeCity* successively divides the map into quarters, so making it easier for *BAU3D* to spot what can and can't be seen.

Having ruled out those objects and parts of objects which are wholly invisible we are left with the problem of polygons which are partially in view. We could just leave it up to the 2D clipping (called the graphics window) to deal with these but this is not reliable. Imagine a long road and ourselves standing halfway along it. Because the polygon extends way behind us this will confuse the plotting routine when in comes to converting 3D co-ordinates into 2D ones.

Object clipping

What we must do is clip the polygon in 3D dimensions so that its vertices are at least of manageable proportions. We can then leave it up to the polygon-plotting code to clip the odd few pixels on-screen.

The images on the left show the stages involved in clipping a polygon. The rectangle shows the visible area. Two points of the polygon are off-screen, so these are slid towards their visible neighbours in turn. If only one vertex is off the screen it is duplicated and the two copies slid towards their neighbours. The other possibility is of three consecutive invisible vertices. Here, the middle vertex is simply deleted and the clipping proceeds as before.

The sliding could be done in a number of ways. The aim is to move an invisible point towards a visible neighbour until it is just visible. Geometry could be used to find the point where line and view pyramid intersect. Our module uses a simpler approach. The invisible point homes in on the edge of the visible rectangle.

Due to the length of the extra BAU3D module source code and the example programs, the listings won't fit in yellow pages. If you want the complete system so far and do not have the subscriber's disc, send a blank E-format disc, with a stamped, addressed envelope to:

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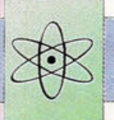
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QUESTIONS AND ANSWERS

Q I keep reading about Archimedes computers, Risc OS computers, 32-bit computers, the A400/1 series, A5000s and so on. Confused isn't the word: what are all these computers, and how does my A3010 fit into it all? Do I have Risc OS 2 or 3 or 3.1, and what's the big deal anyway?

J Mascis
Guildford

A **When Acorn first launched its 32-bit range, it named the computers 'Archimedes'. The name has stuck, though Acorn's 32-bit computers are now referred to as 'Acorn' machines.**

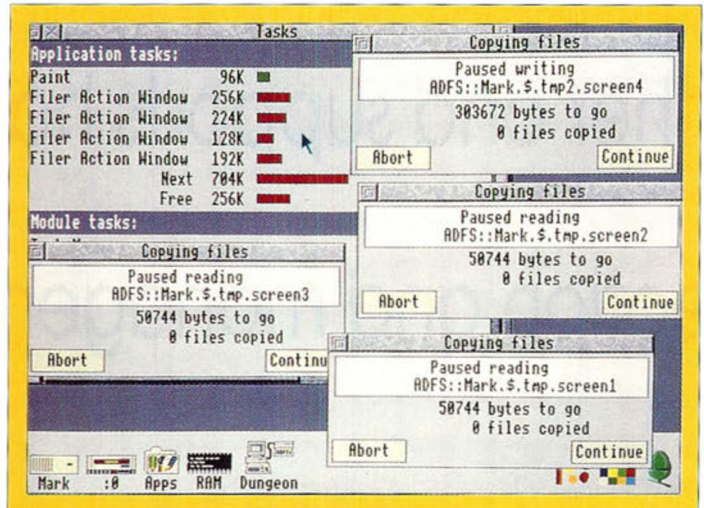
The machines in the 32-bit range are as follows (in chronological order): A305, A310, A440, A410/1, A420/1, A440/1, A540, A3000, A5000, A4, A3010, A3020, A4000. This list does not include the Unix workstations Acorn produces. The last Archimedes to be produced was the A540; after that the distinctive 'A' logo was dropped by Acorn.

These various computers vary considerably in specification, but the one common theme is that each contains an Arm processor: Arm2, Arm250 or Arm3. This enables them all to run the same programs, so it doesn't matter if you have an old A305 or an A5000 – you can still run the same programs. The only pitfall is the operating system.

Early Archimedes computers (the A305, A310 and A440) had the Arthur operating system, which was superseded by Risc OS 2 (in the A410/1, A420/1, A440/1, A540 and A3000).

A new version of the operating system, Risc OS 3, was produced for the A5000, followed by a new version, Risc OS 3.1, for the A4, A3010, A3020 and A4000. Risc OS 3.1 is also available as an upgrade for all the older machines, and is highly recommended to ensure future compatibility.

What all this boils down to is that programs designed for Risc OS will run on any other machine with the same version of Risc OS fitted. So the 32-bit column in the yellow pages compatibility chart applies to all of the above machines which are fitted with Risc OS, though some will only work on Risc OS 3, and are not suitable for use with the older Risc OS 2.



Star question

Q I have got the 'Interactive file copying' flag set on my Risc OS 3 computer, and most of the time file copying is, indeed, multi-tasking. However, sometimes copying or deleting files produces a window in the middle of the screen where the process is detailed, but it is not multi-tasking, and I am asked to press the space bar or to click the mouse to continue. Is my CMOS Ram faulty?

JG Hancock
Romford

A The reason for this problem is simple: lack of memory. Whenever a multi-tasking file copy is started, memory is claimed from the Next and Free slots, and is given the name 'Filer action window'. you can see this in action if you open the Task window and start the copying process.

If there isn't enough memory available to perform this claim, which may happen if you have a lot of applications running, or you have other multi-tasking Filer operations in progress, then Risc OS switches to single-tasking Filer operations, producing the screen display you mention.

The reason the display freezes up is that the Verbose option is switched on. This allows the multi-tasking window to show the progress of the operation, and a command window is opened to show the information displayed. Because the operation is no longer multi-tasking, however, you have to click the mouse after the copy has finished, just as you had to with Risc OS 2.

Q I have recently installed an ICS 60Mb internal hard disc on my 4Mb A3000. It works fine but I am having trouble getting it to recognise a *!Boot* file or application that would run a few utilities (*TinyDirs*, Palette settings) on power-up. I have used all of the following configuration options without success:

```
FileSystem IDEFS
IDEFSDrive 4
Drive 4
Boot
```

I tried creating autoboot files with both Obey and Command filetypes without success. After that I wrote *!Boot* as an application whose *!Run* file contained instructions like `*IDEFSPowerSave 12`, `*Dir !Boot` and `*!TinyDirs` (as I stored *TinyDirs* in my boot directory). When I turned the computer on, none of the instructions was executed and when I double-clicked on *!Boot*, the powersave option worked but only some of the applications ran. Is there a bug in IDEFS or am I doing something wrong?

AS Brown
Milngavie, Strathclyde

A **There are two problems here. First, there's no bug in the IDEFS and your configurations look all right, but you don't make any mention of the command `*OPT 4`. This command tells the filing system what to do when it is told to boot a disc using the *!Boot* file: it either loads the file (`*OPT 4 1`), runs it (`*OPT 4 2`) or executes it using `*EXEC` (`*OPT 4 3`). When you enter this instruction, your choice is written onto the current disc and appears in the top line of the directory when you type `*CAT` from the command line.**

Since your hard disc supplier cannot know which option you want, all hard discs are sold with this option set to 0 (off) and therefore do nothing when told to boot. If you write your *!Boot* file as an Obey file and set the hard disc to `*OPT 4 2`, it should work precisely as it does when you double-click on it.

Your second problem, the fact that your boot file does not run all your applications, may be due to the way you are calling them. In Obey files, particularly boot files, it is good practice to invoke programs using their full pathnames. For example, rather than writing `*Dir !Boot` followed by `*!TinyDirs`

use a line like `Run IDEFS::HardDisc.$.Apps.!Tiny Dirs`, substituting the true name of your hard disc in place of `HardDisc`.

Use the same complete pathname format for every application you call. It means more typing, but this way Risc OS will always know where it can find the next application irrespective of which directory it was left in by the last one.

It also means that you can store your utilities in any location you like on the disc rather than having to hide them away inside *!Boot*. *!Boot* is hardly the first place I'd think of looking for utilities, anyway.

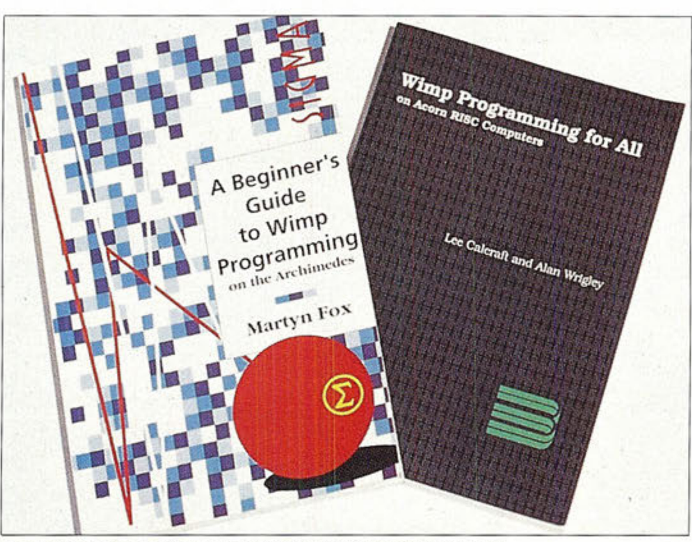
Of course, Risc OS 3.1 has a built-in feature which saves the current state of the desktop as a boot file which you can alter in *Edit*. Just one of the many reasons that you should be thinking of upgrading your machine.

UPDATES

● In January, A Keb wrote in asking for an article on Basic programming for the Risc OS desktop. I told him then that it would probably need a series to deal with the subject. Toby Duckworth, the editor of *Virtuality*, the disc-based magazine for the Arc, wrote in to say that his publication has done just such a series. This is now available on a compilation disc for £5.99.

For more information on this series of articles, write to: *Virtuality*, 1 The Square, Woolavington, Bridgewater, Somerset, TA7 8DL.

There are also the two books which we reviewed last month, *Wimp Programming for All* from *Risc Developments* (ISBN 1-85142-088-6), and *A Beginners' Guide to Wimp Programming* from Sigma Press (ISBN 1-85058-336-6).



A couple of books for all you budding Wimp programmers

● Following Frank Cobbett's request for graphics help with his astrology program (in the February *Acorn User*) I got a letter from Jon Keates in Burton-on-Trent.

Jon is writing just such an application, which he hopes to have released as shareware at some point in the future. He has produced some really nice graphics of astrological charts and a vector font of all the appropriate arcane symbols, but he is still not totally happy with the accuracy of some of his maths routines. I've passed his letter on to Mr Cobbett in the hope that they can collaborate on this one.

● GP Carruthers of Cardigan, Dyfed has got in touch with us regarding the problem with form feeds that Philip Beckett was experiencing while writing a label printing application that uses outline fonts (see the March issue of *Acorn User*).

He points out that if Philip is using Risc OS 3.1, the system is probably inserting its own form feed characters (Ascii 12 or &0C) at the end of each of the pages, on the instructions of the printer definition file.

If this is the case, Mr Carruthers recommends that Philip create a copy of his printer definition file. He will then be able to edit this character out of the graphics mode list using the Configure list in *PrintEdit*.

While he is in there, he could also delete any graphics resolutions that aren't used by his program and then save the new version under a useful name like *Labels*.

Customer hotline

Each month in Acorn User, Alan Glover offers you the latest support and advice from the Acorn customer service department

This month we look at writing software to run on different Risc OS platorms, some reasonably common programming errors you may come acrosss, and how to avoid them.

THE WIMPSLOT VALUE IN THE *!RUN* FILE.

The parameters for the WimpSlot command may take any numeric value. However, they will always be rounded up to the next multiple of the memory page size of the computer. Page sizes vary between eight and 32K. A differing page size is a common source of problems where a program will run on one computer but not another. Here's an example to illustrate the point.

Say a program has a WimpSlot setting of 36K. This is too low, and it should really be about 48K. On a 4Mb machine, with 32K pages, the program will get 64K (two 32K pages) and will run happily. On a 1Mb machine, with 8K pages, it will only get 40K (five 8K pages) and will fail. This kind of failure usually takes strange forms such as failing after a certain time or when a specific operation is attempted. Since many software writers have 4Mb machines rather than 1Mb computers this scenario can easily occur.

USING COLOUR IN THE DESKTOP

Your programs could be run in two-, four-, 16- or 256-colour modes, even higher if a graphics enhancer board is fitted. You should check that the colours you use are distinguishable in all these pixel depths – a common mistake is to choose colours which contrast well in a 16-colour mode but which look identical in a two-colour mode so it becomes impossible to separate the text of an icon from its background. When you are performing VDU output to a window yourself (for example redrawing a window's content) use the facilities provided by *ColourTrans* to get the correct colour number to use for current mode and palette settings. Do not use a colour number which happens to be right in a particular mode; it will not be right in other modes with a different number of bits per pixel.

Don't go overboard with the use of colour. Too much becomes intrusive and distracting.

LOADING YOUR PROGRAM FILES

Do not write programs to use an explicit path to load resource files (so don't use *ADFS::0.MyApps.!Wotsit.!Sprites*). If you do it means users cannot put it where they want on their discs. Now many computers are sold with hard discs fitted, or are easily upgraded to have hard discs, you should ensure that your program can be located on any disc/filing system. Similarly, do not presume that people will only have ADFS or SCSI filing systems – many people have IDE filing systems, for example.

The correct way to do it is to set a system variable to your application directory location in the *!Run* file, as follows:

```
Set Wotsit$Dir <Obey$Dir>
```

Obey$Dir is a system variable which contains the directory in which the file being obeyed resides. Wotsit$Dir is the variable for your application; the naming convention is that the name of the variable is the same as your application name. Thus, in this example, the application should be called *Wotsit*. Once you have done this you can access your files in a location independent manner by using

```
<Wotsit$Dir>.!Sprites
```

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Hints and tips

Technical trickery and useful tips from your fellow readers

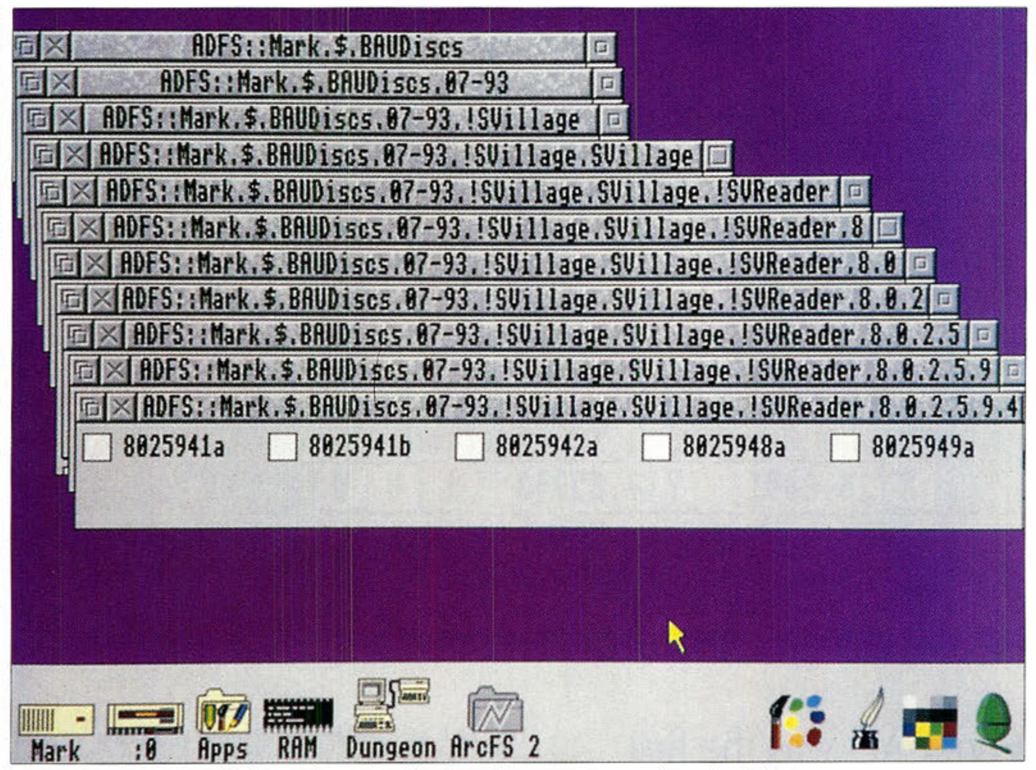
Welcome to Hints and Tips. If you have any of your own tricks to share, please send them in to us at: Hints and Tips, *BBC Acorn User*, 101 Bayham Street, London NW1 0AG.

ADJUST YOUR MOUSE

A Hodson

There are a lot of clicks and drags which, although they are documented, are not used as much as they should be. As the complete list of clicks is not summarised anywhere, a lot of users fail to use the shortcuts available. The following list of non-obvious clicks might prove useful, especially as far as Adjust is concerned.

- Select-drag on title bar, toggle icon, size icon allows window to be moved, toggled and sized; Adjust-drag does the same without bringing it to the front.
- Adjust on scroll bars or scroll arrows performs the scroll, but in the opposite direction to Select.
- Adjust-drag inside scroll bar allows you to scroll the window both horizontally and vertically at the same time.
- Select on close icon closes the window.
- SHIFT-Select on close icon closes the window, and iconises it onto the Pinboard.
- Double-clicking with Select or Adjust on an iconised window opens that window.
- SHIFT-Menu on an iconised window brings up the application menu for that window.
- Adjust on close icon closes the window, but note the following: for Filer windows, the parent directory is opened (as if Open parent was chosen from the Filer menu), and on editor windows (such as Impression, Edit and so on) the directory containing the file being edited is opened.
- SHIFT-Adjust on close icon does the same as Adjust, but doesn't close the window.
- Clicking Adjust on items in directory windows will then select them without deselecting other items.
- In Filer windows, dragging a bounding box with Select will select any objects inside the box; dragging a bounding box with Adjust toggles the selection of items inside the box (NOT logic).



Avoid clogging up your desktop when traversing deep directory structures by using Adjust

- Dragging selected files with Adjust copies files and closes the source directory.
- Dragging selected files with SHIFT-Adjust moves files and closes the source directory.
- Double-clicking with Adjust on files, directories or applications runs or opens the object, and closes the directory containing that object.
- CTRL-double-clicking on a directory with Select opens that directory without running application boot files.
- CTRL-double-clicking on a directory with Adjust opens that directory without running application boot files, and closes the parent directory.
- SHIFT-double-clicking on files or applications with Select loads the file into *Edit* or it will open up the application directory.
- SHIFT-double-clicking on files or applications with Adjust loads the file into *Edit* or opens the application directory, and closes the directory containing that object.
- Clicking on a menu item with Adjust will choose that item, and will keep the menu structure open.

USEFUL KEYPRESSES

There are a few keypresses which are also useful in writable icons (such as in save boxes). Try the following.

- DELETE deletes a character to the left.
- COPY deletes a character to the right.
- SHIFT-COPY deletes a word to the right.
- CTRL-COPY deletes completely to the right.
- CTRL-U deletes the contents of the whole icon.

The F12 key is also very useful.

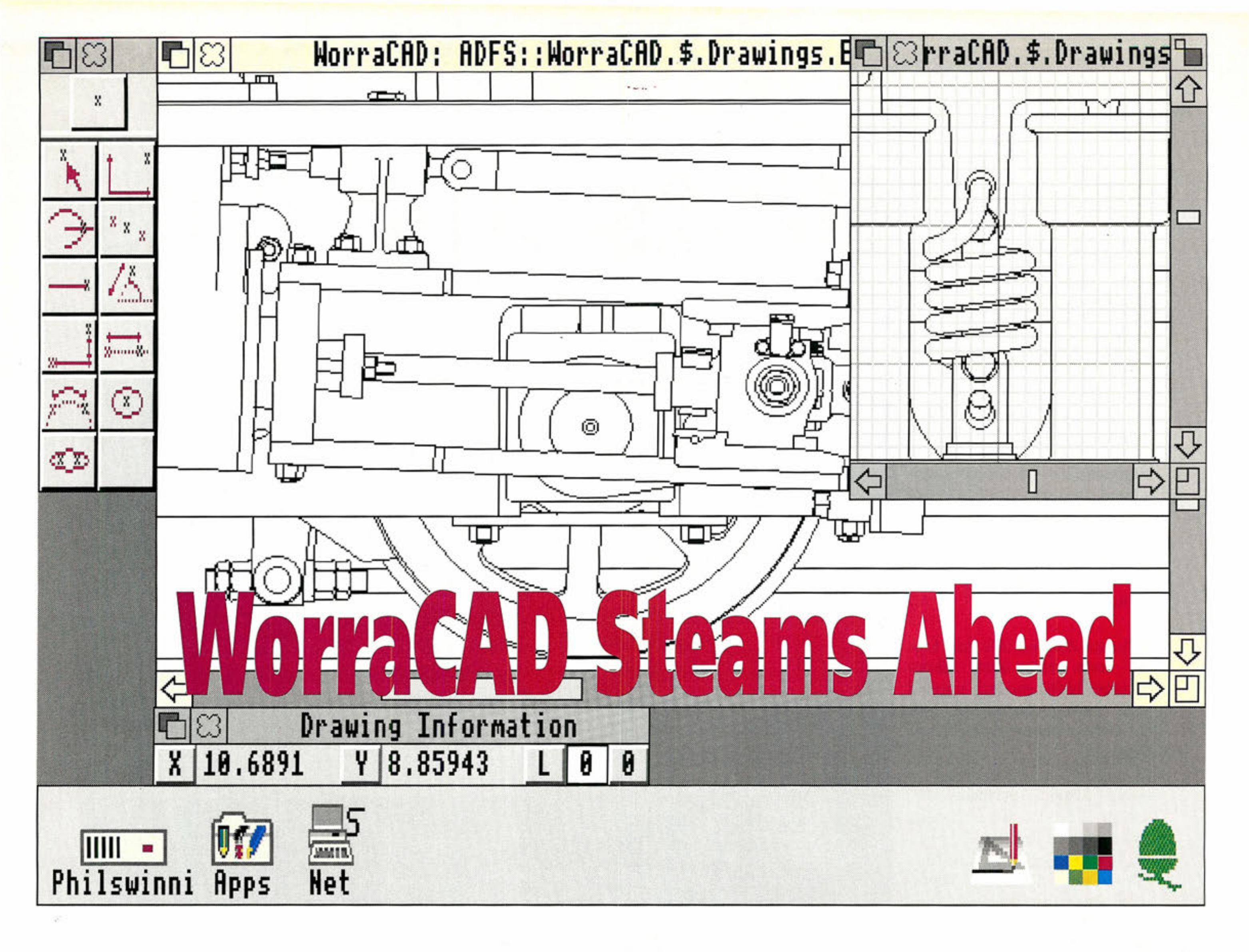
- F12 goes to the command line to enable star commands to be entered.
- SHIFT-F12 brings the iconbar to the front.
- CTRL-F12 brings up a task window, and it will load *Edit* in the process.
- CTRL-SHIFT-F12 shuts the desktop down, and this should be done before switching off the machine.

BETTER SCREENSHOTS

FG Shannan

One problem with *Paint*'s screenshot capability is that you have to drag the file to a directory window to save it; having to have this directory open can ruin your shot. You can always type in a full pathname in the save box, but an easier way is to drag the sprite icon onto *Paint*'s icon: as long as there is enough memory, *Paint* will load the sprite itself.

Another omission of *Paint* screenshots is that the pointer is missing. However, it is easy enough to add one. Save the sprite ptr_default from the file *$.Resources.Wimp.Sprites* in the Apps filing system and give it a palette and a mask. Now change colour one to cyan, two to blue, and white to transparent, and you can paste pointer onto your screenshot using 'Use sprite as brush'.



WorraCAD Steams Ahead

WorraCAD was the first Computer Aided Drafting application for RISC OS and has evolved steadily over the years. Changes to the system have been consolidated with a new release which features a revised user interface.

When WorraCAD was launched, not long after RISC OS, it quickly established itself as a top selling CAD system, not least because it remained for some considerable time, the only CAD system for the RISC OS desktop. It integrated well into the desktop environment thanks to its support for RISC OS printer drivers, and facilities such as export of Drawfiles. The ability to both import and export DXF files to and from CAD systems on other platforms, also helped to firmly establish WorraCAD's industrial base.

Designed to simplify the job of producing accurate technical drawings, WorraCAD was loaded with features to create precision geometric constructions quickly and with ease.

WorraCAD is unique amongst CAD applications for RISC OS in that it uses a floating point, rather than an integer model to internally represent its data. This avoids two major problems:

1. Integer packages tend to have great difficulty in dealing with objects larger than A0 paper - the compromise between accuracy and drawing area means that the largest co-ordinates that can be represented by 32 bit integers can only be a couple of metres from the origin. WorraCAD's data format can handle a drawing area larger than the known universe!

2. At the other end of the scale, integer systems soon run out of resolution, so that an object snapped to an intersection point may not quite be accurately positioned upon close examination. Once again, WorrCAD's floating point data structure removes the problem with its ability to resolve sub-atomic distances.

WorraCAD quickly established a large user base, both in schools and in industry. Professional users are quick to suggest ways of improving software they use all day, every day, and so WorraCAD has evolved steadily over the years to make the job of producing real technical drawings quicker and easier, and new features have been added to increase the functionality of the program.

A recent consolidation of improvements suggested by users has culminated in a new release of the software with a revised user interface. The original WorraCAD user interface was based on the RISC OS menu system, but also had a parallel menu structure based on that of Oak PDT. Both these remain (as configurable options) but the new method of driving WorraCAD is via an icon based toolbox. One reason for the change is that pupils no longer get the opportunity to spend a lot of time learning about technical drawing and its terminology, and so a text based menu referring to 'Tangents' and 'Normals' is less readily understood than an icon showing the construction.

WorraCAD in this new guise, remains, perhaps not the most flashy, but certainly the most useful and useable RISC OS CAD system, for those who need to create accurate technical drawings.

Not so baby Bio

Since the Daves introduced their modular desktop tool, they have been bombarded with ideas to make Bio even more multipurpose. Here is new, improved, Bio+

Back in February we introduced the application to end all applications – *Bio*. This modular desktop tool was designed to let simple Basic programs work on the desktop.

Since then we have received suggestions from readers and we hope *Bio* will form a regular feature in *Acorn User*. To get the ball rolling, we present an updated version of *Bio*, called *Bio+* and a couple of new *Bio* modules. *Bio+* isn't really version 2 (which we are planning) but does contain enhancements and has had some of its features fixed. Next month will see some more *Bio* utilities so watch this space.

To update *Bio* to *Bio+*, merge the program *Biolines* with the *!RunImage* from the original application. Some lines are new, others replace existing lines – so make sure the line numbers match. You will also need to run *PalDat* to create the file *Palettes*. The fully-revised application can be found on the subscriber's disc.

One of the most useful enhancements we've made is allowing *Bio* modules to output to a sprite rather than to produce a file or result strings. As an example, try our *Graph Plotter* plot module.

A new flag, called -window can be returned in your FNxxx_args function and, if present, your module may output to a sprite. Your main function should then create a sprite using FNcreate_window. This takes the mode number, *x* and *y* size (OS co-ordinates) and window title as parameters. It returns 0 if the sprite could not be created. Now, screen output has been redirected to your sprite so you can PLOT, PRINT and so on as if you were outside the desktop. When done, the sprite is displayed in a window. Click on this with Menu to save the result as a sprite.

The palette of the sprite is set to the appropriate default but you may change it using PROCvdu19. This behaves as VDU 19 but changes the palette of the sprite rather than the physical colours in use. PROCdesktop_palette changes all the colours to those of the desktop. This will only have a visible effect in four- or 16-colour modes.

Help memory and *DragASprite* have also been added. Your module should contain an extra function called FNxxx_help which takes two parameters: a window and icon handle. It should return an appropriate *Help* string.

The window handle will be either -1 (your icon on the iconbar); 1 (your result window, if you have one); or the 'real' handle of your setup window. Only in this last case is the icon handle valid. As an example, add *HexHelp* to the original *HexDump* module to give interactive help.

You can claim all available memory (from the Wimp free-pool) using FNclaim_memory (base,size). The function returns FALSE if no memory is available, otherwise base is the start of the block, and size its extent (a multiple of the page size).

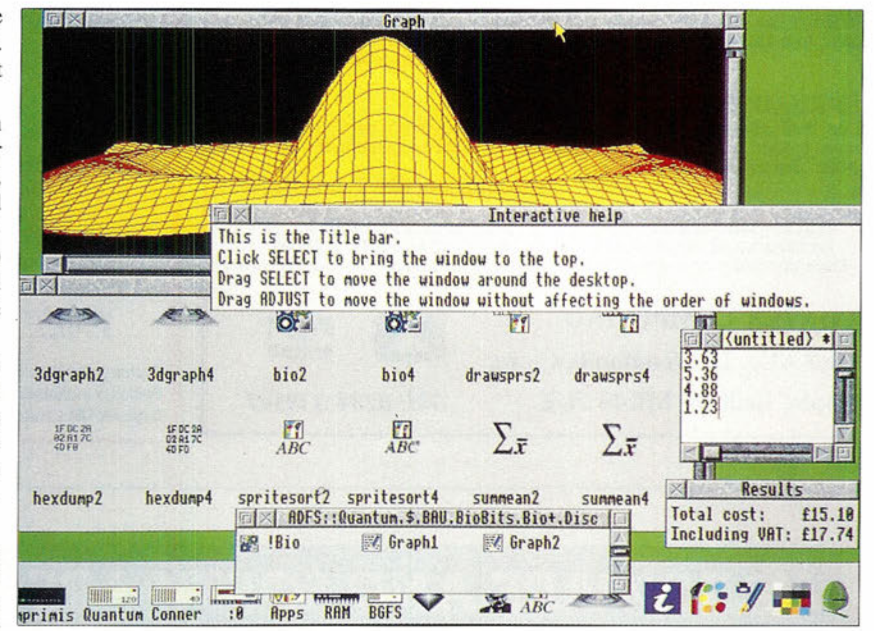
The memory will be returned to the Wimp free-pool when you finish. If your module creates a sprite window, the window should be created before using claim_memory, otherwise there will be no memory to create the sprite.

As promised, *Bio* has been updated to support Risc OS 3's *DragASprite* module. To enable sprite dragging for *Bio* and all other compliant applications use: *FX 162,28,3

Graph Plotter is an example of a *Bio* module that produces a window containing a sprite as its result. To use, create a subdirectory *3DGraph* in *!Bio.Library* and save in it *3DGraph*. Now run *3Ddat* inside the subdirectory to create the sprite file. Install *Help* for further assistance.

Sprite Sorter sorts sprites in a file into order. This can either be straight (Ascii, with 10 coming between 1 and 2) or numeric (numbered sprites appear before named ones). To use, create a subdirectory *SpriteSort* in *!Bio.Library*, save *SpriteSort* inside and run *Sortdat*.

As a bonus we include *Vat Calc*, supplied by Robert Fuller. There was no room for it in the yellow pages, so it is an extra on the disc.



3DGraph, Interactive Help, Vat Calc and Sprite Sorter all in action at once in Bio. Clever eh?



*INFO

Dave Lawrence and Dave Acton present their monthly mix of programs, for all Acorn users

STAR PROGRAM !

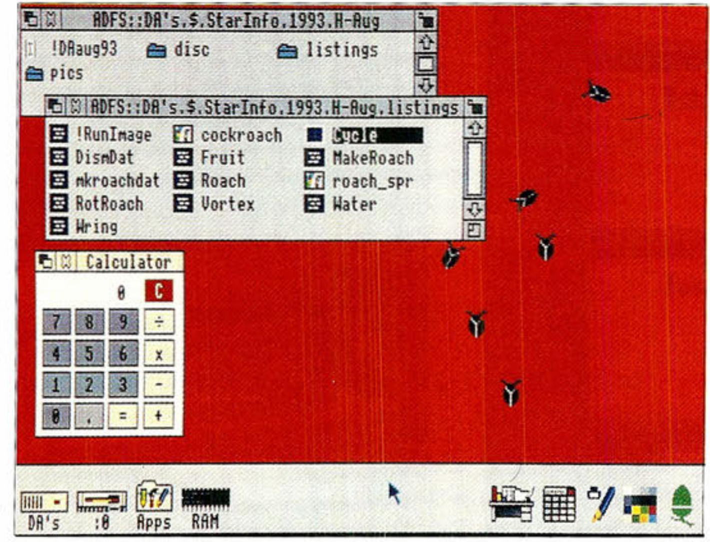
ORTHOPTERA RISCOSII

Programs: MakeRoach, Roach, RotRoach
Description: Desktop bugs
Authors: Original by Niall Douglas, Pinboard version by DCA
Machine: 32-bit (Risc OS 3)

There have been many desktop sillies – ducks that swim along the iconbar, little men that climb up the sides of your windows – but none are quite as creepy as *Cockroach*, sent in by Niall Douglas. His little desktop bugs love the dark and hide under windows; if uncovered they scuttle away to find another quiet corner to continue their roachy business.

Niall wrote his original program in Basic, like most of the listings in *INFO, and it worked rather like the Risc OS 3 Pinboard. First he opened a window behind all the others and plotted the roaches in it.

We came across a problem though – one shared by all desktop sillies of this type. The Risc OS 3 Pinboard also likes to be behind all the other windows and this led to a clash between the applications. We tried all ways and means of resolving this clash but couldn't come up with anything satisfactory. We finally decided that the only solution would be to rewrite the roach program in Machine Code and patch it into the *Pinboard* module itself. As it happens, this wasn't as complicated as we thought and we are proud to present *Roach* version 2, with all credit going to Niall for the original creepy idea.



Great therapy for all you insect paranoiacs

There are three listings – two to generate the sprites needed and one to patch in the extra code. First run *MakeRoach*. This will generate a sprite file *Cockroach* containing a single sprite of the roach facing upwards. You could define your own sprite – it should be in Mode 12, 32 pixels wide by 16 high. Don't use a sprite mask; instead, use colour 15 for any pixels you want masked out. Now run *RotRoach*. This takes the sprite file *Cockroach* and produces another called *Roach_Spr* which contains 32 rotated versions of the original sprite.

Having created the *Roach_Spr* file, to install the bugs you simply need to issue the command:

```
*IconSprites Roach_Spr
```

and `CHAIN "Roach"` before entering the desktop. The roaches start life under the iconbar. If a window comes close enough they'll scuttle under it. Whenever they're exposed they'll dash to another window, or they'll run back under the iconbar.

The basic idea is very simple. Each roach has a current position and direction, and a destination position. When a roach is safely covered it moves to its destination, chooses another safe one at random and moves again. When the roach is uncovered, the destination is reset to the middle of a randomly-chosen window and scuttles off as fast as its legs will carry it.

Two patches are applied to the *Pinboard* module. One adds a short piece of code to handle null desktop events (which would normally be ignored by the Pinboard) and this moves the roaches, checks if they're hidden and so on. Another patch is added to the end of the window redraw loop and this simply plots the roaches as icons using the Wimp_PlotIcon call.

While developing *Roach* we realised a good sprite rotation routine would be necessary and *RotRoach* was the result. Although there is an OS_SpriteOp call to plot a rotated sprite, the small size of the roach meant that the results weren't particularly good. Often bits of antennae were lost and curves became jagged. Since this is a problem shared by many who need to rotate sprites (for animation in games) we thought it would be worth describing *RotRoach* on its own. You may like to adapt it to rotate your own sprites.

Two techniques are used to ensure the rotated version is a good likeness of the original. Anti-aliasing ensures that smooth edges remain smooth. Imagine a white pixel on the original cockroach. When rotated, this might not fall exactly on a pixel in the sprite; it might lie midway between two, for example. In this case, rather than approximating and setting one of the two pixels to white, averaging is applied and each pixel is set to a shade of



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Line-by-line Roach

It's a while since we focused on a machine code program, and as *Roach* is also desktop-compatible we thought it would be an ideal candidate for an in-depth description.

70 Set number of roaches. Arm3 users can increase this a little.
80 Set number of angles. You can alter this but it should be a power of 2 and you'll need to change *RotRoach* as well as provide the right number of sprites.
90 Set maximum number of windows to examine. Starting with the pinboard at the back, a table is built up containing the positions of each window. So this doesn't take too long, a maximum is imposed and windows further forward are ignored.
100 Set maximum roach speed.
110 Set roach size. This is in OS units. You may alter the size of a roach but ensure you alter the sprite and *RotRoach* too – roach sprites must be square.
120 Name registers 13, 14 and 15.
130 Read the start address of the Pinboard module.
140 Get the size of the *Pinboard* module (stored in the word before).
150 Report an error if the patch has already been applied.
160 Reserve some space.
170-190 Copy the old module down.
200 The main assembly loop.
210 Set the program counter to &D08 to patch an instruction.
230 Patch the instruction that sets the mask prior to a Wimp_Poll call. This is so the pinboard accepts null events.
250 Set the PC to &D30 for another patch.
270 Insert a branch into a jump table to call our handler for null Wimp events.
290 Set the PC to &F48 for the final patch.
310-320 Insert a branch with link to call our redraw routine at the end of the main redraw loop.
360 Our redraw routine.
370 Preserve all registers except r0 and r1 which will be set prior to return by Wimp_GetRectangle.
380 r10 = roach count.
390 r9 -> roach table.
400 The main redraw loop.
410 Get roach's current position (r5,r6) and direction (r7).
420-430 Position refers to centre of roach sprite, so subtract half of size from X and Y before plotting.
440 r1 -> block for Wimp_PlotIcon.
450 Store co-ordinates in block to form left & lower icon bounds.
460-470 Store right bound of icon.
480-490 Store upper bound of icon.
500-530 Convert direction to string to form sprite name roachXX.
540-550 Plot roach as an icon using Wimp_PlotIcon. This saves the need to build any scaling or colour conversion tables.
560 Move r9 on. For ease, each roach has 32 bytes allocated to it with the last 12 wasted.
570-590 Update counter and repeat loop for all roaches.
600-610 Do the Wimp_GetRectangle our patch replaced.
620 Return to the pinboard redraw loop.
640-730 A Wimp icon block.
750 Our null event handler.
770 Update the table of window extents.
780 r10 = roach counter.
790 The main loop.
800-810 r9 -> data for roach r10.
820 Read position (r5,r6) and direcion (r7).
830-870 Work out X distance from current position to destination. If less than max_speed+4 our roach hasn't arrived yet.
880-920 Do the same for the Y direction.
930-940 Set current position to destination.
950-970 Get a random number in the range -31 to +31. It's easy to get a random number in the range 0 to 63 and subtracting 32 gives a range -32 to +31. The slight weight to the minus side forces roaches to left, so -32 is changed to 0 to even things out.
980 Add offset to current X position.
990-1020 Add random offset to Y position.
1030 Is this a new position?
1040-1050 If not, roach is safe and this becomes new destination.
1060 Skip past the code to move the roach.
1070 The code to move the roach. If the current direction is D, then directions D-3 to D+3 are tried to find which will bring the roach closest to its destination. This avoids the need for arc-tangents and more complicated maths.
1080 r8 = direction offset (-3 to +3).
1090 r4 = distance of best direction so far.
1100 The loop to find the best direction.
1110-1130 r2 -> X movement table.
1140-1150 Add X movement to current position.
1160-1170 Calculate X distance from destination.
1180-1190 Square it.
1200-1260 Do the same for Y and add squares together.
1270-1290 If direction brings roach closer to destination it becomes the 'best so far'.
1300-1320 Loop back.
1330 Turn to best direction found.
1340-1390 Move roach in current direction.
1410-1460 Call Wimp_ForceRedraw with a rectangle known to cover old and current roach positions. The screen will be updated by the Wimp by calling our redraw routine if rectangle is visible.
1470-1490 See if current destination is visible (has the roach been uncovered?).
1500 If not, roach is safe – skip next bit.
1510 r3 = number of windows.
1520 r4 = counter used to ensure roaches don't all scuttle towards same window.
1530-1550 Add a random offset to r4.
1560-1590 Bring r4 in range so it's a valid window number.
1600 Store r4 back for next time.
1610-1630 Get visible area of chosen window.
1640-1690 Set new destination to middle of window.
1710 Store back roach's position and direction.
1720-1740 Loop back.
1750 Return to Pinboard module.
1810-1820 Allocate memory to x and y movement tables.
1830 Allocate memory to roach table.
1850 Routine to build list of windows.
1870 Move stack pointer down and use stack for 36 bytes of workspace.
1880-1910 Get state of Pinboard window. Pinboard stores main window handle in [r12,#28].
1930-1970 Calculate origin for pinboard window and store in ax0, ay0. These are the offsets, calculated from the window's position and scroll bars (not used by Pinboard, in fact) which must be added to a roach's position within the window's work area to convert to real screen co-ordinates (for comparison with other windows).
1980 r11 = window count.
1990 r9 -> window list.
2000 The main loop.
2010 Get handle of window in front of current one (initially the Pinboard window).
2020-2040 If -1 there are no more in front – exit loop.
2050-2070 Get state of window.
2080-2100 Copy window bounds to table.
2110-2120 Loop back.
2140-2170 Read XWindLimit and add 1 – this is the number of pixels across the current screen.
2180-2190 Read XEigFactor.
2200 Calculate width of screen in OS units.
2210-2250 Add special window to list which represents icon bar. This is 128 OS units high and the width of the screen.
2260-2280 Store number of windows, release the stack workspace and return.
2300-2340 The limits of the iconbar (right edge calculated).
2400 A routine to check whether point (r2,r3) is hidden under any of the windows in the current list.
2420-2450 Convert X,Y to screen co-ordinates.
2460 r9 -> window list.
2470 r10 = no. of windows.
2480 r11 = counter.
2490 The checking loop.
2500-2510 Have we reached the end of the list? If so, return with EQ set since point must be visible.
2520 Update counter.
2530 Read visible area of window.
2540-2560 If X<minx or Y<miny try next window.
2570-2590 If X>maxx or Y>maxy try next window.
2600-2610 Point is covered by window so return with EQ not set using CMN r0,r0 (always NE).
2630-2730 A random number generator. A pseudo-random number is returned in r0. This was invented by regular ✱INFO contributor Nick Craig-Wood.
2780-2850 Set up the roach table so each roach has a random direction and position under the iconbar.
2860-2900 Set up the movement tables.
2910 Insert our patched module back into the module list, replacing the original.
2950 A function to reserve bytes for a table.
3000 A function to set the program counter.

grey. The eye is fooled by this trick and the quality of the image improves.

Another trick used by *RotRoach* is error-spreading. In fact, a version of the standard *Floyd-Steinberg* error correction is used. The idea is to find the closest available colour to the one needed (in the case of *Roach* the closest colour from the desktop selection of 16). You then plot the pixel in that colour, work out how much the colour was out from the ideal and add this error to the ideal colours of the adjacent pixels. So, if we need a dark red, but only have a bright red available, this might be used as the best match and the adjacent pixels made less red to compensate.

We anticipate that many more desktop sillies could be written using the technique of patching the *Pinboard* module; if you come up with any we would be delighted to publish any good ones. To assist with your desktop coding, read this month's *Line-by-line* box which focuses on *Roach*.

CYCLING SHORTS

Programs: Cycle, Vortex, Water
Description: Animations
Author: Christopher Bassett
Machine: Eight-bit

Colour cycling is the tried and trusted method behind these short but pretty animations from Christopher Bassett of Devon. The idea is to create a Mode 2 screen using 14 of the available colours in sequence to plot objects, like a waterfall or spinning wheel. (The two remaining colours are reserved for black and static objects.) Then, at playback, the colours are changed to white (or another colour) in turn, while the others remain black. The result is fast and smooth animation with no sprite plotting.

The two programs *Vortex* and *Water* create screens for animation. Run them and the files *VortScr* and *WatrScr* will be saved to disc. Now run *Cycle* and select an animation. The screen is loaded and the colours cycled. Press 1, 2 or 3 to set the speed or the space bar to reverse the cycling. ESCAPE returns to the menu.

New animations can be added to *Cycle* easily – just



add another line of data at the end. For each animation there are four items of data: the name, screen name, the colour used for animated parts and the colour of static elements.

We'll be providing you with another couple of Christopher's applications as soon as we are able to.

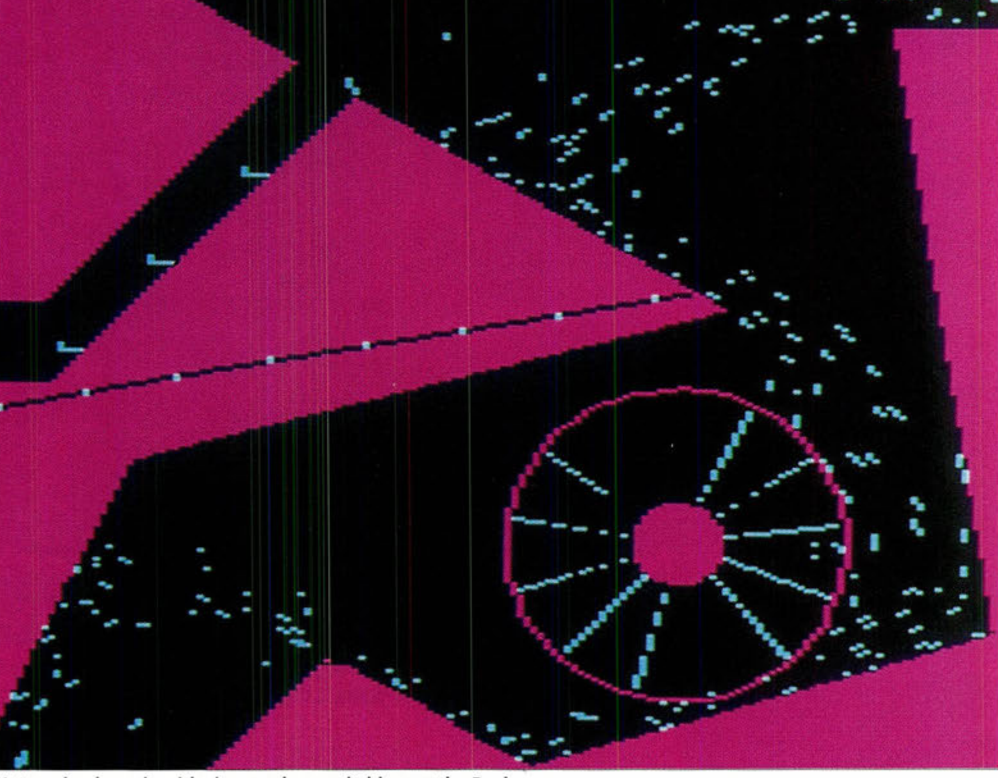
QUICK DISMOUNTING

Programs: !RunImage, DismDat
Description: Disc utility
Author: Robert Adamson
Machine: 32-bit

To avoid the desktop getting confused it is recommended you dismount each floppy after use. This entails bringing up the disc menu each time, and this can be a real pain when looking through a whole batch of discs.

So, try this utility instead. Robert has provided a short desktop application which sits on the iconbar. Just click on the dismount icon with Select to dismount the disc in drive 0, or Adjust to mount the disc.

There are two listings – create a directory called *!Dismount* and save *!RunImage* in it. Now enter the directory and run *DismDat* in order to create the other files that you need. If you want to save some typing, design your own icon, 45 pixels wide by 17 high in Mode 12 and to be called *!Dismount*.



Water wheel magic with clever colour switching on the Beeb

RING THING

Program: Wring
Description: Impossible graphic demo
Author: Albert Hoekstra
Machines: All

Not much to say except it works on all machines and has to be seen not to be believed.

ONE-LINE CORNER: GRID LOCK!

Program: Griddle
Description: Logic game
Author: Andrew Clover
Machines: All

Regular readers should remember Andrew from last month – he's the one who wrote the *real* version of our little April Fool wheeze.

This contribution is a little ditty that will work on any machine, although Andrew originally wrote it on the Beeb. The computer overlays a given number of randomly-spaced grids on the screen. As these are EOR-plotted the end result is a weird combination of black and white areas.

The idea of the game is to clear the screen to black by guessing the spacing of the overlayed grids on the screen. The spacing of each grid can be between one and nine and pressing these keys will either remove an existing grid or it will make the pattern even more complex.

You are asked to select a difficulty level at the start, with one being the easiest; this determines the number of frames initially printed on top of one another.

We have added one extra feature to Andrew's original game; there is now a small buffer which makes it impossible to simply press a key again if you guess wrong. By default, *m* is set to one which means you have to press at least one other number before you can undo a mistake. Upping this to two makes the game quite a bit harder. A value of 0 will result in Andrew's original game. Multisync owners may like to change the screen mode to either Mode 18 or Mode 25 for a better display.

Don't stare at this too long; it's enough to give you a serious blinder behind one eye

ONE-LINE BANDIT

Program: Fruit
Description: Fruit machine
Author: DCA
Machines: 32-bit

Another desktop one-liner now, following on from the triumph of our one-line clock.

Fruit is a one-line fruit machine which uses the same trick of creating files on the Ram disc. Simply open the Ram disc and double-click on *Fruit.* The reels will spin and a Basic program (whose name is your balance) will appear. Just double-click on this when you want to play again.

Each game costs £1 and if you run out of cash, run *Fruit* again. You win your stake back if any reel shows a text file. Get the first two reels the same and the prize is £3. Three in a row scores anything from £4 for three text files up to £10 for three absolute files. Make sure your Filer display is set to Large icons and Sort by name for this one.

SECONDS OUT...

Program: OnTimeSrc
Description: Adds the time to desktop welcome screen
Author: Paul Clifford
Machine: 32-bit

Our run on 'patches' is catching on, Paul Clifford of Woodford Green has sent in a piece of code that adds a friendly little message to the Risc OS startup banner and tells you the time. This makes use of two features we have written about in the past. Last November we showed how files can be 'registered' into the resource filing system and carry a short program that uses the SWI calls necessary.

Paul's module also uses these SWIs to replace the banner text file normally resident in Rom. If you glance back at the March issue, you'll see we covered this file then.

As the file needs to change each time the desktop is entered, we cannot simply register a file using the *Register* program from November. Instead Paul has effectively included a copy of the file within his module, with a gap left for the time.

When the Wimp starts up, service call &49 is issued, which is trapped by the module and is used to alter the time string. The new 'file' is then registered with the resource filing system as soon as the resource filing system is started up.

This has to be done by intercepting another service call (&60), which is issued when the *ResourceFS* module is reloaded or reinitialised – in other words on desktop startup.

As *ResourceFS* is not yet linked into the module system, it is not possible to use the RegisterFiles SWI call. If you look in Paul's code at point_to_resource you'll see what has to be done instead.

One final note about the module: the seemingly random numbers in the EQUD block at .resources are the load and execution addresses of the file – in this case, a time stamp and file type (text). The 3 corresponds to the file attributes.

Round and round and round we go...

FAN-TASTIC

Program: Fans
Description: Fans!
Author*:* Pavlos Record
Machine*:* 32-bit

A shorty, but quite pleasant none the less. *Fans* is actually two one-liners; the same principle applies in each, just the setup bit changes. The Fixed option draws twenty fixed-sized fans on a grid, the Random option places 60 randomly-sized fans with random speeds at random places on the screen.

Both programs then use a simple colour cycling loop to produce the effect of animation. This may seem quite elementary, but have a quick glance at Chris Bassett's eight-bit colour cycling demos (as described above on page 97) to see what can be achieved with this simple technique on eight-bit technology.

SPEED FREAK

Program: MemSpeed
Description: Calculates Ram speed
Author: Nick Craig-Wood
Machine: 32-bit

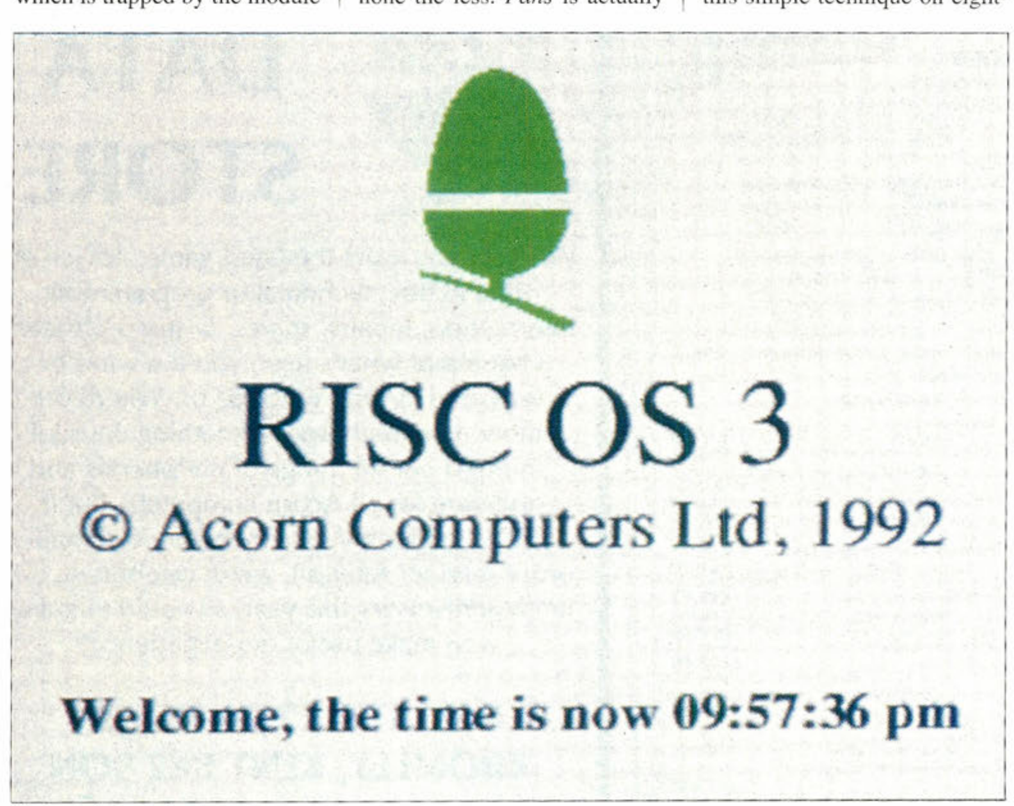
Here's a short piece of code for all you speed freaks. It calculates the speed of your computer's memory. On an old machine this will probably be 8MHz, on a A5000 12MHz, and on a Simtec Super-Turbo A3010 (reviewed in this issue, folks) 20MHz.

The bulk of the code is taken up with a huge block of ADD instructions, each taking one cycle. These instructions are compiled in the loop in lines 810 to 860.

The time to execute this block of 25000 ADDs is calculated using one of IOC's timers – we can't use the system clock as we are switching off interrupts. A running average is generated (in Basic) to even out any fluctuations.

One interesting note is that a fudge factor is needed to get the correct result. This is because crossing a quad-word boundary (in other words going from an address ending in &C to one ending in &0) adds an extra cycle, so the time returned will be 25 per cent too high – the variable fudge takes care of this.

Another point of interest is the function FNarm3, which determines whether the machine running the program has an Arm3 fitted or not. It does this by checking the existence of the SWI call which controls the flushing Arm3 cache, namely Cache_Flush.



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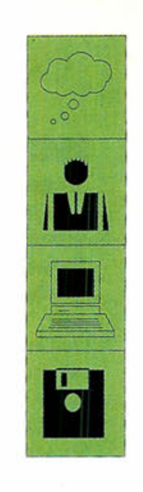
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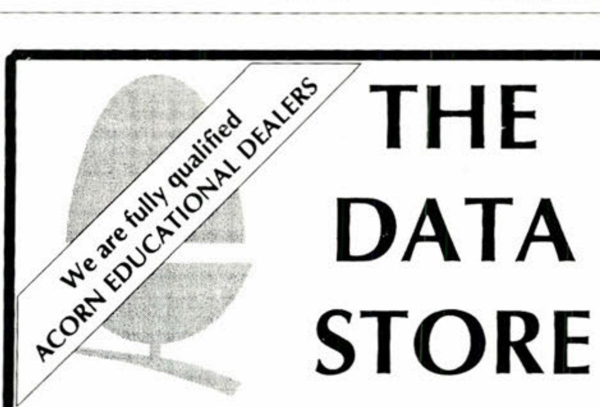
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VIRTUAL DIRECTORIES

Description: Neatens desktop filer windows
Author: Peter Greenham
Machine: 32-bit (Risc OS 3)

Peter's got fed up with being presented with a large amount of redundant information in the title bars of filer windows. A directory called, say, *ADFS::IDEDisc4.$.Peter.Work.Programs* need only really be called *Programs* as, unless you are a stranger to the directory structure, the rest of the pathname is largely unnecessary. Peter's idea combines two techniques we have covered at various times in *INFO, that of path variables and the Filer_OpenDir command. With these he has produced virtual filing systems which he calls *Areas*.

Each area has a root directory denoted by a pound sign, which corresponds to the $ symbol used by the regular filers. Another symbol could be chosen if you wanted, but beware: some symbols, such as $, @ and &, have a special meaning to the filer and will be disallowed. In all other respects areas behave the same as a normal filing system. To create an area, first create an application directory, like *!Programs*. Open this with SHIFT double-click and create a subdirectory called *£*. Then create an Obey file in *Edit* which contains the following two lines:

```
Set Programs$Path <Obey$Dir>.
Filer_OpenDir Programs:£
```

Don't forget the full stop on the end of the first line. Save this as *!Run*. Now, if you return to the directory containing *!Programs* (by Adjust-clicking the *!Programs* directory close icon) and double-click on *!Programs*, a filer-window entitled *Programs:£* should appear. You can then treat this filer in exactly the same way as a normal filer, after all it *is* a normal filer, all that's happened is its name has been simplified. The application name can be anything, so *!Programs* could have been called *!Progs* if you wanted, as the important bits are the names in the *!Run* file.

You may want to add a *!Sprites* file to the *Programs* application, so you're not just stuck with the boring app icon. A *!Boot* file might also be useful to set up the Programs$Path variable – feel free to experiment. One further advantage of this system is that the £ directory need not be on the same disc or even filing system, consider the following two lines instead of the above:

```
Set Apps$Path scsi::SyQuest.$.Apps.
Filer_OpenDir Apps:£
```

This could be the *!Run* file for a directory called *!Apps* that was on an internal IDE drive, but clicking on it would open the correct directory on the SCSI device. This also allows you to effectively have many copies of applications in different directories – all you need to do is to copy the *!Apps* directory. This would be of most use on a network, where each user could have access to a pool of shared resources.

Honestly, this looks much more realistic when it's going round and round; just like a real piston in a real engine, in fact

FONT-ASTIC!

This very handy hint comes courtesy of Simon Weaver:

'When using lots of different-sized fonts it is extremely painful to wait for them to be cached. It is often recommended to copy your *!Fonts* directory onto a Ram disc to help speed things up.

'Unfortunately, this method does have its drawbacks. Firstly, if you need more fonts the Ram disc is not resizable and secondly each weight needs a separate directory which eats up 2K. Then there are the *!Sprites*, *!Run* and *!Boot* files for the *!Fonts* directory itself.

'The cunning solution? Register the fonts into *Resource:$.Apps* using the *Register* program from November 1992's *INFO. This effectively add them to the fonts built into Rom. Font access is therefore very fast and, if necessary, each font can be stored in a separate module which can then be loaded and killed (using *RMLoad and *RMKill respectively) as required. A *FontInstall command is all that is required to initialise the new fonts, as this command initiates a re-scan of the current font path.'

*DISC

It's amazing the response we've had to AH Evans' letter in April's Questions & Answers asking for four-stroke engine simulators. In our opinion the best has come from JE Tarrant of Hazlemere, and his program *Engine* can be found on the monthly disc.

As the program stands, you'll need about 64K of system sprite area configured to accomodate the sprite creation.

It also runs a little slowly on Arm2 machines. To cure this, there is a faster program on the disc called *Engine2*, a super-squished version of the original. Pressing F12 and typing *RMFaster Basic will also make a difference. If it is still too slow, you could always grab each screen as a sprite and play the frames back from memory or disc at a better rate.

You'll also find all the other *INFO programs on the subscriber's disc, including ready-assembled copies of Robert Adamson's *Dismount* and Christopher Bassett's eight-bit colour cycling demos.

*QUIT

Once again, we've run out of space and the postbag is positively bulging with submissions. Please don't let this put you off, though, as we always welcome your work.

All but the very shortest of programs should be on disc accompanied by quick instructions as to how to use them. Please write your name, address and program title on all discs and include a suitable stamped addressed envelope if you want your disc returned.

Program explanations and further details are very helpful and, if possible, should be included on the disc in the form of a *ReadMe* text file. We've recently received a number of discs with viruses on them; we do try to disinfect everything before they get near the *INFO machines, but please be extra vigilant when sending discs to us. We will also warn the originators of these discs to get out the rubber gloves and dettol.

We also welcome hints, tips, suggestions, ideas for features, questions, answers, applications, requests, short-cuts, patches, bugs, features and comments. Please let us know how we're doing and what you'd like to see this pages. Above all keep sending in programs, because what we would like to see on these pages is your work.

Send your submissions to: *INFO, BBC Acorn User, Redwood Publishing, 101 Bayham Street, London NW1 0AG.



● A3000, 2Mb Ram, Acorn multisync monitor, Vidc enhancer, serial port upgrade, Learning Curve software, Hot Links Presenter and games worth £120 – £525 ono. Contact Mr J Wimsett, Middlesex. Tel: 081-898 0447

● A3000, 2Mb, colour monitor and stand, superb condition – £500, BBC B, disc drive, mono monitor, Panasonic printer, joystick, software – £250. Contact Mr J Gayner, London. Tel: 081-946 4193

● Wanted: Laser Direct interface board for Canon LBP-4 printer, also requires Archimedes software and accessories. Contact N Duffield, Coventry. Tel: (0203) 445174

● Archimedes 310 base unit in excellent condition, includes mouse, keyboard and all original manuals and discs, comes with much software but no monitor, hence – £350. Contact P Silva, Sutton. Tel: 081-643 4337

● Master Turbo Taxan high resolution monitor, 30Mb hard drive and 5.25in and 3.5in double disc drives, Rom cartridge, 64K battery-backed cartridge, Teletext adaptor – £350. Contact Mr T Wittering, Derbyshire. Tel: (0602) 307411

● Z88 plus two 128k Ram packs, 32k Eprom, PC Link, printer cable, RS232 cable (Valv 2 £482), excellent condition, first – £130 secures. Contact Mr W Jackson, Dunmurry. Tel: (0232) 610602

● BBC B, 3.5in disc drive, Plinth, 20 odd discs, manual – £95 ono. Contact A Strange, Somerset. Tel: (0823) 672893 evenings

● Wanted: BBC Acorn User issue numbers 1-41, 43, 45, 47-50, 52, 84, 85, 99 – £10 ono, for sale or swap, issue 53. Contact Mr E Ross, Cheltenham. Tel: (0242) 231988

● Watford 32K Shadow Ram, as new, original box, full instructions – £25, BBC disc games, Pipeline, Sam 2, Spell Binder, Quest, Citadel, Castle Quest – all £5. Contact Mr T Warner, Clwyd. Tel: (0978) 751673

● Complete BBC/Master upgrade to Archimedes 310, medium resolution monitor, 4Mb Memc/a, interfaced twin 80/40-track disc drives in monitor plinth, serial link, quality software and many games – £700 ono. Contact P Thomas, Oakham. Tel: (0572) 821313

● A5000, multiscan monitor, 40Mb hard disc, 2Mb Ram, Learning Curve and extra software, cost £1799 accept – £1399, only five months old. Contact Mr J Dooley, Gwynedd. Tel: (0492) 593321 daytime

● Archimedes 410/1, 53Mb hard drive, 4Mb Ram, Arm 3, Risc 3, Midi, 5.25in and 3.5in disc drive, multi sync monitor, Swift 24-colour printer, lots of software – £1200 ono. Contact B Moore, Hull. Tel: (0482) 565727

● Electron, Plus 1, Pres Plus 3, games, joystick, Viewsheet Rom, all leads and manuals – £185, Seikosha SO1900-Plus printer – £80. Contact S Shakeel, London SE19. Tel: 081-670 2073 after 6pm

● BBC B with DFS, as new, original box and manual – £75, Cumana 40/80-track power supply unit disc drive – £75. Contact Mr R Emmerson, Tyne & Wear. Tel: 091-417 1324

● Wanted: Contact to sell and swap Archimedes games, I have got Gods, Populous, Saloon Deluxe and I would like Gribbly's Fervour, Ego etc. Contact Mr J Crompton, Oxon. Tel: (0993) 705434

● Z88 with two 128K Ram packs, no manuals or power supply unit, hence – £95. Contact Mr B Schofield, Notts. Tel: (0602) 372874

● Mega 3 Rom – £50 ono, includes Interword/Sheet/Chart. Write to Mr D Lowless, 82 Main Street, Pembroke, Dyfed SA71 4HH

● Pace Linnet modem, cable and manual, superb condition – £85 ono. Contact Mr B Janaway, Hampshire. Tel: (0420) 563978

● Master 128, colour monitor, double 40/80-track double-sided disc drive, printer, games and utilities – £350 ono, BBC B+ 32K, tape recorder, modem, joystick, games – £120 ono. Contact Mr D Beales, Newcastle Upon Tyne. Tel: 091-286 3668

● A5000, 4Mb, 40Mb hard disc, Learning Curve, ten games and full year of all three Acorn mags including discs, ten months old – £1550 ono. Contact Mr Loft. Tel: (0483) 576779

● Archimedes software: Render Bender I – £40, Corruption (never used) – £8. Contact Mr B Sherren, Kent. Tel: (0304) 372933

● BBC B, Opus DDos, disc drive, cassette recorder, 1200/75, Modem, Rom board c/w Wordwise +, Intersheet, Quest, Paint, Toolkit, printer Rom, manuals, mouse, joystick – £200. Contact M Woodham, Middlesex. Tel: 081-868 5695

● Cumana 80-track 5.25in disc drive – £30, both good condition. Contact A Chilinski, Northampton. Tel: (0604) 413792

● Pro-Artisan and Impression Junior, boxed with manuals – £30 each. Contact Mr R Jones, Maidenhead. Tel: (0628) 416511

● Printer MP-165, draft 40cps NLQ, stands, manuals, cables, good condition, boxed – £120 ono. Contact Mr C Dyer, Cirencester. Tel: (0285) 659872

● A3000 with Arm 3, OS3, colour monitor, Scsi, 20Mb and 50Mb external hard drive, Impression II, Pipedream 3, Compression and much more – £950. Contact Mr J Crabtree, Dartmouth. Tel: (0803) 832505

● BBC B, 80-track double disc drive, Speech, DFS, data recorder, games and hundreds of cassettes/discs, cost £320 sell for – £160 ono. Contact P Pankin. Tel: (0440) 61318 after 3pm

● Two BBC Bs, one with Interword etc, twin drive DDFS, green screen, daisy wheel, dot matrix c/o Swithc – £200 the lot. Contact M Dunmore, Oxon. Tel: (0608) 810002

● Master 128 – £150, 3.5/5.25in dual drive in plinth – £50, Master modem – £40, Master 512 with mouse, Dabs books and Shareware collection – £100, manuals, software. Contact Mr G Henderson, St Albans. Tel: (0727) 873606

● A4 Notebook 4/60 for sale due to change in school policy, very good condition, further details from Pip Cartwright, IT Co-ordinator, Norwich. Tel: (0603) 860505

● Wanted: Archimedes assembler, Acorn desktop Assembler or cheaper version, required to link with Ansi C. Contact Mr J Montagu, Brockenhurst. Tel: (0590) 612345

● Archimedes 310, 4Mb Ram, double internal 3.5in disc drives, double external 5.25in disc drives, Econet module, RGB colour monitor, Brother M-1924L printer – £950. Wanted: A3010, 2Mb Ram. Contact Mr T Gabriel, Carlisle. Tel: (0228) 810563

● BBC Games (5.25in) – Sam 7, 11, 13, 15 – £50 each, Exile, Holed Out – £6 each. Contact Mr J Medlock, Grantham. Tel: (0400) 81400

● Archimedes 310M with keyboard, mouse, colour monitor and printer, software includes: DTP, 1st Word Plus, Logistix (spreadsheet), ProArt (graphics), Zarch, IB Mulator, all with manuals and licences, boxed as new – £800 ono. Contact Mr M Peters, Avon. Tel: (0275) 333374

● BBC Master Compact 128, disc drive, RGB colour monitor, Citizen 180E printer, joystick, games, View, wordprocessor, complete, as new – £425 ono. Contact Mr J Harris, Kent. Tel: (0304) 367088

● 64K/Turbo Electron, two tape recorders, Plus 1, 3.5in disc drive, dpm 2000 printer, discs and books – £70. Contact R Withrington, Essex. Tel: (0277) 221846

● Wanted: manual for Watford Electronics Video Digitiser for BBC B (to buy or borrow). Contact A Craig, Cheshire. Tel: (0928) 575948

● A3000 2Mb Ram, Philips monitor stand – £600 ono, BBC B, 5.25in double disc drive, monitor, stand, software, books – £250 ono. Contact Mr W Scott, Oxon. Tel: (0865) 391427

● BBC B, double disc drive, modem, many Roms including Interword, games, manuals – sell £250 only. Contact Mr Kumar. Tel: 081-902 2519

● Contacts wanted to swap PD software, replies to all letters, for details contact Mr O White, 53 Kings Road, Walton-on-Thames, Surrey KT12 2RB

● BBC B, twin 40/80-track disc drive, Toolkit Plus, Printmaster, Wordwise Plus, Prestel, Graphics Extension, Rom board, manuals, FX80 printer – £200. Contact E Epps, Oxford. Tel: (0608) 810573

● Chocks Away Compendium – £15, Olympics – £10, Interdictor 2 – £15, Microdrive – £5. Contact Mr C Fisher, Walsall. Tel: (0922) 57814

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YELLOW PAGES

Free programs for you to type in and use

HOW TO ENTER THE PROGRAMS

This section describes how to enter and use the more complicated programs in the yellow pages. A lot of the explanations mention the Currently Selected Directory (CSD): for more details on the CSD, see the box below.

*INFO (page 95)

Info1 – Info3

Type in and save all three listings, and set the CSD to the directory in which you save the listings. Double-click on *MakeRoach* and *RotRoach* (in that order) to produce the two sprite files *Cockroach* and *Roach_Spr*. Next exit the desktop, type `*Basic` and `CHAIN "Roach"`, and then re-enter the desktop by typing `*Desktop`. This will install the Cockroach code.

To include the Cockroach into your boot sequence, add the following lines to the start of your boot file:

```
IconSprites ADFS::Mark.$.Cockroach.Roach_Spr
Run ADFS::Mark.$.Cockroach.Roach
Desktop
```

This example assumes the files Roach and Roach_Spr have been saved in the directory *$.CockRoach* on disc *Mark*.

Info4 – Info6

Type in the three programs and save them all on the same disc. Run *Vortex* (by typing `CHAIN "Vortex"`) to create the file *VortScr*, and run *Water* (by typing `CHAIN "Water"`) to create the file *WatrScr*. Finally, type `CHAIN "Cycle"` to run the main program.

Info7 – Info8

To create the whole *Dismount* application, do the following:

- Create a directory called *!Dismount*.
- Double-click on this directory while holding down SHIFT.
- Type in the two programs *DismDat* and *!RunImage* and save them inside *!Dismount*.
- Set the CSD to *!Dismount*.
- Double-click on *DismDat* to create the *!Run* and *!Sprites* files.

BIO (page 93)

To convert Bio into Bio+, do the following:

- Merge the files *!Bio.Library.ToneDial.Sprites* and *!Bio.Library.HexDump.Sprites* into *!Bio.Library.BioSprites*
- Rename Library.ToneDial.Templates as Library.˜ToneDial.
- Rename Library.HexDump.Templates as Library.˜HexDump.
- Move *Libary.ToneDial.ToneDial* up into *Library*, and delete the *ToneDial* directory.
- Move *Libary.HexDump.HexDump* up into *Library*, and delete the *HexDump* directory.
- Add the lines in *Biolines* to *!Bio.!RunImage*.
- Set the CSD to inside *!Bio*, and run *Paldat* to create the file *Palettes*.
- Save *3Ddat* and *Sortdat* inside *Library*, set the CSD to *Library*, run them to create the files *3DSprites*, *SrtSprites* and *˜SprSort*, merge the sprite files *3DSprites* and *SrtSprites* into *BioSprites* and delete *3Ddat, 3DSprites, Sortdat and SrtSprites*.
- Add the file *HexHelp* to the *HexDump* program from last time, and finally save *3Dgraph* and *SpriteSort* inside *Library*. The *Bio+* application is now complete.

Setting the Currently Selected Directory (CSD)

Some of the explanations above require the CSD to be set to a certain directory in order for them to work. To do this, you must first create an Obey file (using *Edit*) containing just the following line:

```
Dir <Obey$Dir>
```

Next save it under the name *ThisDir* in the directory you wish to set as the CSD. Finally, double-click on *ThisDir* to set the CSD to that directory.

COMPATIBILITY CHART

Use this chart to check if a program will work on your machine. There are two columns: one for eight-bit machines like the Model B and Master 128, and one for 32-bit machines, like the A3000, A400 or A3010. If there is a star for the program in the column then it will work on your machine. Special exceptions and hardware requirements are listed as footnotes at the end of the table.

Article	Program Name	8-bit	32-bit
***INFO (page 95)**			
Info1	*Roach*		*
Info2	*MakeRoach*		*
Info3	*RotRoach*		*
Info4	*Cycle*	*	
Info5	*Vortex*	*	
Info6	*Water*	*	
Info7	*!RunImage*		*
Info8	*DismDat*		*
Info9	*Wring*		*
Info10	*OnTimeSrc*		*
Info11	*Griddle*		*
Info12	*Fruit*		*
Info13	*Fans*		*
Info14	*MemSpeed*		*
BIO (page 93)			
Bio1	*Biolines*		*
Bio2	*Paldat*		*
Bio3	*3Ddat*		*
Bio4	*3DGraph*		*
Bio5	*HexHelp*		*
Bio6	*Sortdat*		*
Bio7	*SpriteSort*		*

*INFO (page 95)

Listing Info1

```
  10 REM    >Roach (Info1)
  20 REM By  DCA
  30 REM     Original by Niall Douglas
  40 REM For Risc OS 3
  50 REM (c) BAU August 1993
  60 :
  70 roaches=8
  80 angles=32
  90 max_wind=16
 100 max_speed=32
 110 roach_size=64
 120 sp=13:link=14:pc=15
 130 SYS "OS_Module",18,"Pinboard" TO ,
,,pin_addr%
 140 pin_size%=!(pin_addr%-4)
 150 IF pin_size%>&42FC ERROR 17,"Roach
es already installed"
 160 DIM code% pin_size%+&1000
 170 FOR i%=0 TO pin_size%-1 STEP 4
 180  code%!i%=pin_addr%!i%
 190 NEXT
 200 FOR pass%=4 TO 6 STEP 2
 210 PROCset_pc(&D08)
 220 [OPT pass%
 230         MOV     r0,#&30
 240 ]
 250 PROCset_pc(&D30)
 260 [OPT pass%
 270         B       my_null
 280 ]
 290 PROCset_pc(&F48)
 300 [OPT pass%
 310         BL      my_redraw
 320         MOVNV   r0,r0
 330 ]
 340 PROCset_pc(pin_size%)
 350 [OPT pass%
 360 .my_redraw
 370         STMFD   (sp)!,{r2-r11 ,link
}
 380         MOV     r10,#0
 390         ADR     r9,roach_tab
 400 .draw_roach_loop
 410         LDMIA   r9,{r5-r7 }
 420         SUB     r5,r5,#roach_size
DIV 2
 430         SUB     r6,r6,#roach_size
DIV 2
 440         ADR     r1,icon_block
 450         STMIA   r1,{r5-r6 }
 460         ADD     r14,r5,#roach_size
 470         STR     r14,[r1,#8]
 480         ADD     r14,r6,#roach_size
 490         STR     r14,[r1,#12]
 500         MOV     r0,r7
 510         ADR     r1,icon_block+25
 520         MOV     r2,#4
 530         SWI     "XOS_ConvertCardin
al1"
 540         ADR     r1,icon_block
 550         SWI     "XWimp_PlotIcon"
 560         ADD     r9,r9,#32
 570         ADD     r10,r10,#1
 580         CMP     r10,#roaches
 590         BLT     draw_roach_loop
 600         ADD     r1,r12,#&450
 610         SWI     "XWimp_GetRectangl
e"
 620         LDMFD   (sp)!,{r2-r11 ,pc}
 630
 640 .icon_block
 650         DCD     0
 660         DCD     0
 670         DCD     0
 680         DCD     0
 690         DCD     %11010
 700         EQUS    "roach0"
 710         DCB     0
 720         ALIGN
 730         DCD     0
 740
 750 .my_null
 760         STMFD   (sp)!,{r0-r11 ,link
}
 770         BL      build_window_list
 780         MOV     r10,#0
 790 .null_loop
 800         ADR     r9,roach_tab
 810         ADD     r9,r9,r10,LSL #5
 820         LDMIA   r9,{r5-r7 }
 830         LDR     r14,[r9,#12]
 840         SUBS    r14,r5,r14
 850         RSBMI   r14,r14,#0
 860         CMP     r14,#max_speed+4
 870         BGT     not_there_yet
 880         LDR     r14,[r9,#16]
 890         SUBS    r14,r6,r14
 900         RSBMI   r14,r14,#0
 910         CMP     r14,#max_speed+4
 920         BGT     not_there_yet
 930         LDR     r5,[r9,#12]
 940         LDR     r6,[r9,#16]
 950         BL      rand
 960         ANDS    r0,r0,#63
 970         SUBNE   r0,r0,#32
 980         ADD     r2,r0,r5
 990         BL      rand
1000         ANDS    r0,r0,#63
1010         SUBNE   r0,r0,#32
1020         ADD     r3,r0,r6
1030         BL      check_visible
1040         STRNE   r2,[r9,#12]
1050         STRNE   r3,[r9,#16]
1060         B       roach2
1070 .not_there_yet
1080         MVN     r8,#2
1090         MOV     r4,#&7F000000
1100 .find_best_dir
1110         ADD     r2,r7,r8
1120         AND     r2,r2,#angles-1
1130         ADR     r14,move_x
1140         LDR     r14,[r14,r2,LSL #2
]
1150         ADD     r14,r14,r5
1160         LDR     r0,[r9,#12]
1170         SUB     r0,r14,r0
1180         MOV     r1,r0
1190         MUL     r11,r0,r1
1200         ADR     r14,move_y
1210         LDR     r14,[r14,r2,LSL #2
]
1220         ADD     r14,r14,r6
1230         LDR     r0,[r9,#16]
1240         SUB     r0,r14,r0
1250         MOV     r1,r0
1260         MLA     r11,r0,r1,r11
1270         CMP     r11,r4
1280         MOVLT   r4,r11
1290         MOVLT   r3,r2
1300         ADD     r8,r8,#1
1310         CMP     r8,#3
1320         BLE     find_best_dir
1330         MOV     r7,r3
1340         ADR     r14,move_x
1350         LDR     r14,[r14,r7,LSL #2
]
1360         ADD     r5,r5,r14
1370         ADR     r14,move_y
1380         LDR     r14,[r14,r7,LSL #2
]
1390         ADD     r6,r6,r14
1400 .roach2
1410         LDR     r0,[r12,#28]
1420         SUB     r1,r5,#(max_speed+
4)+roach_size DIV 2
1430         SUB     r2,r6,#(max_speed+
4)+roach_size DIV 2
1440         ADD     r3,r1,#roach_size+
2*(max_speed+4)
1450         ADD     r4,r2,#roach_size+
2*(max_speed+4)
1460         SWI     "XWimp_ForceRedraw
"
1470         LDR     r2,[r9,#12]
1480         LDR     r3,[r9,#16]
1490         BL      check_visible
1500         BNE     dest_hidden
1510         LDR     r3,wins
1520         LDR     r4,hide_count
1530         BL      rand
1540         AND     r0,r0,#15
1550         ADD     r4,r4,r0
1560 .pick_a_wind
1570         CMP     r4,r3
1580         SUBGE   r4,r4,r3
1590         BGE     pick_a_wind
1600         STR     r4,hide_count
1610         ADR     r14,wind_list
1620         ADD     r14,r14,r4,LSL #4
1630         LDMIA   r14,{r0-r3 }
1640         ADD     r0,r0,r2
1650         ADD     r1,r1,r3
1660         MOV     r0,r0,ASR #1
1670         MOV     r1,r1,ASR #1
1680         STR     r0,[r9,#12]
1690         STR     r1,[r9,#16]
1700 .dest_hidden
1710         STMIA   r9,{r5-r7 }
1720         ADD     r10,r10,#1
1730         CMP     r10,#roaches
1740         BNE     null_loop
1750         LDMFD   (sp)!,{r0-r11 ,pc}
1760
1770 .hide_count
1780         DCD     0
1790
1800 ]
1810 move_x=FNtable(angles*4)
1820 move_y=FNtable(angles*4)
1830 roach_tab=FNtable(roaches*32)
1840 [OPT pass%
1850 .build_window_list
1860         STMFD   (sp)!,{r0-r11 ,link
}
1870         SUB     sp,sp,#36
1880         MOV     r1,sp
1890         LDR     r0,[r12,#28]
1900         STR     r0,[r1]
1910         SWI     "XWimp_GetWindowSt
ate"
1920         ADD     r14,sp,#4
1930         LDMIA   r14,{r0-r5 }
1940         SUB     r14,r0,r4
1950         STR     r14,ax0
1960         SUB     r14,r3,r5
1970         STR     r14,ay0
1980         MOV     r11,#0
1990         ADR     r9,wind_list
2000 .build_wind_loop
2010         LDR     r14,[sp,#28]
2020         CMN     r14,#1
2030         CMPNE   r11,#max_wind-1
2040         BEQ     built_list
2050         STR     r14,[sp]
2060         MOV     r1,sp
2070         SWI     "XWimp_GetWindowSt
ate"
2080         ADD     r14,sp,#4
2090         LDMIA   r14,{r0-r3 }
2100         STMIA   r9!,{r0-r3 }
2110         ADD     r11,r11,#1
2120         B       build_wind_loop
2130 .built_list
2140         MVN     r0,#0
2150         MOV     r1,#11
2160         SWI     "XOS_ReadModeVaria
ble"
2170         ADD     r3,r2,#1
2180         MOV     r1,#4
2190         SWI     "XOS_ReadModeVaria
ble"
2200         MOV     r2,r3,LSL r2
2210         STR     r2,icon_bar_limits
+8
2220         ADR     r14,icon_bar_limit
s
2230         LDMIA   r14,{r0-r3 }
2240         STMIA   r9!,{r0-r3 }
2250         ADD     r11,r11,#1
2260         STR     r11,wins
2270         ADD     sp,sp,#36
2280         LDMFD   (sp)!,{r0-r11 ,pc}
2290
2300 .icon_bar_limits
2310         DCD     0
2320         DCD     0
2330         DCD     0
2340         DCD     128
2350
2360 .ax0    DCD     0
2370 .ay0    DCD     0
2380 .wins   DCD     0
2390
2400 .check_visible
2410         STMFD   (sp)!,{r0-r11 ,link
}
2420         LDR     r14,ax0
2430         ADD     r2,r2,r14
2440         LDR     r14,ay0
2450         ADD     r3,r3,r14
2460         ADR     r9,wind_list
2470         LDR     r10,wins
2480         MOV     r11,#0
2490 .check_loop
2500         CMP     r11,r10
2510         LDMEQFD (sp)!,{r0-r11 ,pc}
2520         ADD     r11,r11,#1
2530         LDMIA   r9!,{r4-r7 }
2540         CMP     r2,r4
2550         CMPGE   r3,r5
2560         BLT     check_loop
2570         CMP     r2,r6
2580         CMPLE   r3,r7
2590         BGT     check_loop
2600         CMN     r0,r0
2610         LDMFD   (sp)!,{r0-r11 ,pc}
2620
2630 .rand   STMFD   (sp)!,{r1-r4 ,link}
2640         ADR     r14,seed
2650         LDMIA   r14,{r0-r3 }
2660         MLA     r4,r0,r1,r2
2670         STR     r4,seed
2680         EOR     r0,r0,r4,ROR #16
2690         LDMFD   (sp)!,{r1-r4 ,pc}
2700
2710 .seed   DCD     TIME
2720 .mul    DCD     1664525
2730 .add    DCD     907633393
2740
2750 ]
2760 wind_list=FNtable(16*max_wind)
2770 NEXT pass%
2780 FOR i%=0 TO roaches-1
2790  a%=code%+roach_tab+32*i%
2800  a%!0=RND(1200)
2810  a%!4=64
2820  a%!8=RND(8)-1
2830  a%!12=a%!0
2840  a%!16=a%!4
2850 NEXT
2860 FOR i%=0 TO angles-1
2870  a=2*PI*(i%/angles)
2880  !(code%+move_x+4*i%)=max_speed*SI
N(a)
2890  !(code%+move_y+4*i%)=max_speed*CO
S(a)
2900 NEXT
2910 SYS "OS_Module",11,code%,P%
2920 PRINT"Roaches installed"
2930 END
2940 :
2950 DEF FNtable(size%)
2960 P%+=size%
2970 O%+=size%
2980 =P%-size%
2990 :
3000 DEF PROCset_pc(off%)
3010 O%=code%+off%
3020 P%=off%
3030 ENDPROC
```

Listing Info2

```
  10 REM    >MakeRoach (Info2)
  20 REM By  DCA
  30 REM     Original roach by Niall Do
uglas
  40 REM For Risc OS 3
  50 REM (c) BAU August 1993
  60 :
  70 MODE 12
  80 DIM roach_spr% 400
```

```
  90 !roach_spr%=400
 100 roach_spr%!4=0
 110 roach_spr%!8=16
 120 roach_spr%!12=16
 130 GCOL 15
 140 RECTANGLE FILL 0,0,64,64
 150 FOR y%=2 TO 15-2
 160  READ dat$
 170  FOR x%=8 TO 31-7
 180   GCOL EVAL("&"+MID$(dat$,x%-7,1))
 190   POINT 2*x%,4*y%
 200  NEXT
 210 NEXT
 220 SYS "OS_SpriteOp",&110,roach_spr%,
"roach",,0,0,63,63
 230 SYS "OS_SpriteOp",&10C,roach_spr%,
"Cockroach"
 240 PRINT"Created file 'Cockroach'"
 250 END
 260 :
 270 DATA FFFFFF77077FFFFFF
 280 DATA FFFF777707777FFFF
 290 DATA FFF77777077777FFF
 300 DATA FF7777770777777FF
 310 DATA FF7777770777777FF
 320 DATA FF7777771777777FF
 330 DATA FF7777712177777FF
 340 DATA FFF77107770177FFF
 350 DATA FFFF067777760FFFF
 360 DATA FFFFF7777777FFFFF
 370 DATA FFF77FFFFFFF77FFF
 380 DATA 777FFFFFFFFFFF777
```

Listing Info3

```
  10 REM     >RotRoach (Info3)
  20 REM By  DCA
  30 REM     Original roach by Niall Do
uglas
  40 REM For Risc OS 3
  50 REM (c) BAU August 1993
  60 :
  70 MODE 12
  80 OFF
  90 DIM roach_spr% 32*1024
 100 !roach_spr%=32*1024
 110 SYS "OS_File",255,"Cockroach",roac
h_spr%+4
 120 size=64
 130 DIM transform(2,2),in(2),out(2)
 140 DIM pal(15,2),rgb(2),err1(size,2),
err2(size,2)
 150 angles=32
 160 sub=0.25
 170 subn=8
 180 spop%=&2E
 190 GCOL 128+4
 200 CLG
 210 GCOL 15
 220 RECTANGLE FILL 0,0,128,128
 230 SYS spop%,&122,roach_spr%,"roach",
0,0
 240 FOR i=0 TO 15
 250  READ rgb
 260  pal(i,0)=(rgb>>0) AND &FF
 270  pal(i,1)=(rgb>>8) AND &FF
 280  pal(i,2)=(rgb>>16) AND &FF
 290  COLOUR i,pal(i,0),pal(i,1),pal(i,
2)
 300 NEXT
 310 PRINT"Rotating roaches..."
 320 FOR i=0 TO angles-1
 330  a=2*PI*(i/angles)
 340  roach$="roach"+STR$i
 350  SYS spop%,&10F,roach_spr%,roach$,
,size DIV 2,size DIV 4,12
 360  SYS spop%,&11D,roach_spr%,roach$
 370  transform()=COS(a),-SIN(a),(size/
2)*(1-COS(a))+(size/2)*SIN(a),SIN(a),COS
(a),(size/2)*(1-COS(a))-(size/2)*SIN(a),
0,0,1
 380  FOR y=0 TO size-1 STEP 4
 390   FOR x=0 TO size-1 STEP 2
 400    rgb()=0
 410    mask=0
 420    FOR xx=0 TO 1
 430     FOR yy=0 TO 3
 440      in(0)=x+xx
 450      in(1)=y+yy
 460      in(2)=1
 470      out()=transform().in()
 480      p=POINT(out(0),out(1))
 490      IF p<0 OR p=15 THEN p=4:mask+
=1
 500      rgb(0)+=pal(p,0)
 510      rgb(1)+=pal(p,1)
 520      rgb(2)+=pal(p,2)
 530     NEXT
 540    NEXT
 550    SYS spop%,&12C,roach_spr%,roach
$,x DIV 2,y DIV 4,-(mask<subn)
 560    IF mask=subn THEN
 570     gcol=0
 580    ELSE
 590     set=subn-mask
 600     r=rgb(0)/subn+err1(x,0)
 610     g=rgb(1)/subn+err1(x,1)
 620     b=rgb(2)/subn+err1(x,2)
 630     IF r<0 r=0 ELSE IF r>255 r=255
 640     IF g<0 g=0 ELSE IF g>255 g=255
 650     IF b<0 b=0 ELSE IF b>255 b=255
 660     SYS "ColourTrans_ReturnGCOL",(
r<<8)+(g<<16)+(b<<24) TO gcol
 670     r_err=r-pal(gcol,0)
 680     g_err=g-pal(gcol,1)
 690     b_err=b-pal(gcol,2)
 700     err1(x+1,0)+=r_err*7/16
 710     err1(x+1,1)+=g_err*7/16
 720     err1(x+1,2)+=b_err*7/16
 730     err2(x+1,0)+=r_err*1/16
 740     err2(x+1,1)+=g_err*1/16
 750     err2(x+1,2)+=b_err*1/16
 760     err2(x,0)+=r_err*5/16
 770     err2(x,1)+=g_err*5/16
 780     err2(x,2)+=b_err*5/16
 790     IF x>0 THEN
 800      err2(x-1,0)+=r_err*3/16
 810      err2(x-1,1)+=g_err*3/16
 820      err2(x-1,2)+=b_err*3/16
 830     ENDIF
 840     GCOL gcol
 850    ENDIF
 860    SYS spop%,&12A,roach_spr%,roach
$,x DIV 2,y DIV 4,gcol
 870   NEXT
 880   err1()=err2()
 890   err2()=0
 900   GCOL 4
 910   RECTANGLE FILL (i MOD 8)*128,102
4-128*(1+i DIV 8),size,size
 920   SYS spop%,&122,roach_spr%,roach$
,(i MOD 8)*128,1024-128*(1+i DIV 8),8
 930  NEXT
 940 NEXT
 950 SYS spop%,&10C,roach_spr%,"Roach_S
pr"
 960 PRINT"Finished"
 970 END
 980 :
 990 DATA &F0F0F0,&D0D0D0,&B0B0B0,&9090
90
1000 DATA &707070,&505050,&303030,&0000
00
1010 DATA &904000,&00E0E0,&00C000,&0000
D0
1020 DATA &B0E0B0,&008050,&00B0F0,&F0B0
00
```

Listing Info4

```
  10 REM     >Cycle (Info4)
  20 REM By  Christopher Bassett
  30 REM For 8-bit machines
  40 REM (c) BAU August 1993
  50 :
  60 DIM file% 25,code% 100
  70 PROCassem
  80 ON ERROR VDU 20:REPORT:PRINT" at l
ine ";ERL:END
  90 REPEAT
 100  MODE 7
 110  train%=FALSE
 120  PRINTTAB(13,0)CHR$(141);CHR$(130)
;"Cycle Ride"
 130  PRINTTAB(13,1)CHR$(141);CHR$(130)
;"Cycle Ride"
 140  PRINTTAB(13,2)CHR$(132);STRING$(1
2,"_")
 150  PRINTTAB(8,3);CHR$(129);"by Chris
topher Bassett"'
 160  RESTORE
 170  n%=0
 180  REPEAT
 190   READ name$,fn$,c1%,c2%
 200   IF name$<>"END" PRINTTAB(15);CHR
$(n%+65);" - ";name$;:n%=n%+1
 210  UNTIL name$="END"
 220  PRINT''"Select animation (A-";CHR
$(n%+64);")"
 230  REPEAT
 240   k%=GET AND &DF
 250  UNTIL k%>=65 AND k%<65+n%
 260  MODE 2
 270  PROCload_pic(k%-65)
 280  VDU 23;8202;0;0;0;
 290  PROCanimate
 300 UNTIL FALSE
 310 :
 320 DEF PROCanimate
 330 *FX 229,1
 340 speed%=1
 350 ?dir%=1
 360 REPEAT
 370  IF train% AND ?c%=1 THEN SOUND 0,
-8,6,speed%+1
 380  pause$=INKEY$(speed%)
 390  val%=VAL(pause$)
 400  IF val%>0 AND val%<4 THEN speed%=
(val%*3)-3
 410  IF pause$=" " THEN ?dir%=-?dir%
 420  CALL anim
 430 UNTIL ASC(pause$)=27
 440 *FX 229,0
 450 ENDPROC
 460 :
 470 DEF PROCload_pic(a%)
 480 ?col%=0
 490 RESTORE
 500 FOR i%=0 TO a%
 510  READ name$,fn$,c1%,c2%
 520 NEXT
 530 ?col%=c1%:VDU 19,15,c2%;0;
 540 IF name$="Train" THEN train%=TRUE
 550 PROCoscli("LOAD "+fn$+" 3000")
 560 ENDPROC
 570 :
 580 DEF PROCoscli(line$)
 590 $file%=line$
 600 X%=file% MOD 256
 610 Y%=file% DIV 256
 620 CALL &FFF7
 630 ENDPROC
 640 :
 650 DEF PROCassem
 660 oswrch=&FFEE:osbyte=&FFF4
 670 c%=&70:oc%=&71:dir%=&72:col%=&73
 680 ?c%=1
 690 ?oc%=0
 700 FOR opt%=0 TO 2 STEP 2
 710 P%=code%
 720 [OPT opt%
 730 .anim
 740 LDA #19
 750 JSR osbyte
 760 LDA #19
 770 JSR oswrch
 780 LDA c%
 790 JSR oswrch
 800 LDA col%
 810 JSR oswrch
 820 LDA #0
 830 JSR oswrch
 840 JSR oswrch
 850 JSR oswrch
 860 LDA #19
 870 JSR oswrch
 880 LDA oc%
 890 JSR oswrch
 900 LDA #0
 910 JSR oswrch
 920 JSR oswrch
 930 JSR oswrch
 940 JSR oswrch
 950 LDA c%
 960 STA oc%
 970 CLC
 980 LDA c%
 990 ADC dir%
1000 STA c%
1010 BNE rest
1020 LDA #14
1030 STA c%
1040 .rest
1050 CMP #15
1060 BNE end
1070 LDA #1
1080 STA c%
1090 .end
1100 RTS
1110 ]
1120 NEXT
1130 ENDPROC
1140 :
1150 DATA "Water","WatrScr",6,5
1160 DATA "Vortex","VortScr",6,4
1170 DATA "END","END",0,0
```

Listing Info5

```
  10 REM     >Vortex (Info5)
  20 REM By  Christopher Bassett
  30 REM For 8-bit machines
  40 REM (c) BAU August 1993
  50 :
  60 MODE 2
  70 VDU 19,15,7;0;
  80 c=1
  90 FOR d=0 TO 350 STEP 10
 100  x=640+512*SIN(RAD(d))
 110  y=512+512*COS(RAD(d))
 120  dd=d
 130  r=512
 140  MOVE x,y
 150  p=0
 160  REPEAT
 170   p=p+1
 180   GCOL 0,c
 190   DRAW x,y
 200   c=c+1
 210   IF c=15 THEN c=1
 220   x=640+r*SIN(RAD(dd))
 230   y=512+r*COS(RAD(dd))
 240   dd=dd+3
 250   r=r*0.96
 260  UNTIL p=95
 270 NEXT
 280 GCOL 0,15
 290 MOVE 640,1023
 300 x=640
 310 y=512
 320 FOR d=0 TO 360 STEP 10
 330  IF x>645 THEN DRAW 1279,y:MOVE x,
y
 340  IF x<635 THEN DRAW 0,y:MOVE x,y
 350  x=640+512*SIN(RAD(d))
 360  y=512+511*COS(RAD(d))
 370  DRAW x,y
 380 NEXT
 390 *SAVE VortScr 3000 8000
 400 END
```

Listing Info6

```
  10 REM     >Water (Info6)
  20 REM By  Christopher Bassett
  30 REM For 8-bit machines
  40 REM (c) BAU August 1993
  50 :
  60 MODE 2
  70 VDU 19,15,5;0;
  80 :
  90 REM The rock
 100 GCOL 0,15
 110 MOVE 1279,1000
 120 DRAW 1100,1000
 130 PLOT 85,1279,1023
 140 MOVE 1279,950
 150 DRAW 1100,950
 160 PLOT 85,1279,0
 170 MOVE0,1023
 180 MOVE0,600
 190 PLOT 85,200,1023
 200 PLOT 85,900,600
 210 MOVE 1279,0
 220 MOVE 1279,200
 230 PLOT 85,640,0
```

```
 240 MOVE 700,0
 250 MOVE 300,0
 260 PLOT 85,450,150
 270 MOVE 0,0
 280 MOVE 0,400
 290 PLOT 85,200,400
 300 PLOT 85,0,600
 310 PLOT 85,900,600
 320 :
 330 REM Water in the hole
 340 c=1
 350 FOR y=954 TO 1000 STEP 4
 360  MOVE 1279,y
 370  FOR x=1279 TO 1076 STEP -(RND(21)
+3)
 380   GCOL 0,c
 390   DRAW x,y
 400   c=c+1
 410   IF c=15 THEN c=1
 420  NEXT
 430 NEXT
 440 :
 450 REM Waterfall - part 1
 460 nx=2000
 470 ny=0
 480 g=0.5
 490 FOR N=1 TO 25
 500  x=1100
 510  y=953+RND(43)
 520  MOVE x,y
 530  xs=-(RND(11)+10)
 540  ys=0
 550  REPEAT
 560   GCOL 0,c
 570   DRAW x,y
 580   c=c+1
 590   IF c=15 THEN c=1
 600   x=x+xs
 610   y=y+ys
 620   ys=ys-g
 630  UNTIL POINT(x,y)=15 OR y<600
 640  IF x<nx THEN nx=x:ny=y
 650 NEXT
 660 :
 670 REM Waterfall - Part 2
 680 REPEAT
 690  ny=ny+4
 700 UNTIL POINT(nx,ny)<>15
 710 FOR n=1 TO 20
 720  x=nx
 730  y=ny
 740  nx=nx+8
 750  ny=ny-4
 760  MOVE x,y
 770  xs=3+RND(9)
 780  ys=-2
 790  REPEAT
 800   GCOL 0,c
 810   DRAW x,y
 820   c=c+1
 830   IF c=15 THEN c=1
 840   x=x+xs
 850   y=y+ys
 860   ys=ys-g
 870   IF POINT(x,y)=15 AND x<910 THEN
REPEAT:y=y+4:UNTIL POINT(x,y)<>15:ys=RND
(2)-1
 880   IF POINT(x,y)=15 AND (x>910 AND
y>200) THEN REPEAT:x=x-8:UNTIL POINT(x,y
)<>15:xs=-2+RND(3)
 890  UNTIL POINT(x,y)=15 AND y<200
 900 NEXT
 910 :
 920 REM Bottom of waterfall
 930 nx=0
 940 FOR n=1 TO 20
 950  x=1220
 960  y=190+nx
 970  nx=nx+4
 980  MOVE x,y
 990  xs=-(7+RND(13))
1000  ys=-2
1010  REPEAT
1020   GCOL 0,c
1030   DRAW x,y
1040   c=c+1
1050   IF c=15 THEN c=1
1060   x=x+xs
1070   y=y+ys
1080   ys=ys-g
1090   IF POINT(x,y)=15 AND x>680 THEN
REPEAT:y=y+4:UNTIL POINT(x,y)<>15:ys=RND
(2)
1100   IF POINT(x,y)=15 AND (x<=680 AND
 x>450) THEN REPEAT:y=y+4:UNTIL POINT(x,
y)<>15:ys=7+RND(5)
1110   IF POINT(x,y)=15 AND x<450 THEN
REPEAT:x=x+8:UNTIL POINT(x,y)<>15:xs=-4+
RND(2)
1120  UNTIL POINT(x,y)=-1
1130 NEXT
1140 :
1150 REM Water-wheel
1160 GCOL 0,15
1170 MOVE 850,500
1180 FOR p=0 TO 6.3 STEP 0.08
1190  x=850+200*SIN(p)
1200  y=300+200*COS(p)
1210  DRAW x,y
1220 NEXT
1230 c=1
1240 FOR p=0 TO 6.3 STEP 0.035
1250  x=850+190*SIN(p)
1260  y=300+190*COS(p)
1270  MOVE 850,300
1280  GCOL 0,c
1290  DRAW x,y
1300  c=c+1
1310  IF c=15 THEN c=1
1320  IF INKEY-99 THEN d=359
1330 NEXT
1340 GCOL 0,15
1350 MOVE 852,350
1360 FOR p=0 TO 6.3 STEP 0.08
1370  MOVE 852,300
1380  x=852+50*SIN(p)
1390  y=300+50*COS(p)
1400  PLOT 85,x,y
1410 NEXT
1420 :
1430 REM The lift and balls
1440 GCOL 0,0
1450 MOVE 0,500
1460 MOVE 100,500
1470 PLOT 85,0,600
1480 PLOT 85,100,600
1490 MOVE 500,1000
1500 PLOT 85,100,500
1510 PLOT 85,600,1000
1520 c=1
1530 x=0
1540 y=500
1550 REPEAT
1560  GCOL 0,c
1570  PLOT 69,x,y
1580  PLOT 69,x,y+4
1590  x=x+8
1600  c=c+1
1610  IF c=15 THEN c=1
1620 UNTIL x=72
1630 x=100
1640 c=c-1
1650 REPEAT
1660  GCOL 0,c
1670  MOVE x,y
1680  DRAW x-25,y
1690  PLOT 69,x-25,y+4
1700  PLOT 69,x-25,y+8
1710  y=y+8
1720  x=x+8
1730  c=c+1
1740  IF c=15 THEN c=1
1750 UNTIL y>865
1760 oc=c
1770 ox=x+8
1780 oy=y-8
1790 xs=8
1800 ys=8
1810 g=0.5
1820 x=x-25
1830 REPEAT
1840  x=x+xs
1850  y=y+ys
1860  ys=ys-g
1870  IF POINT(x,y)<>15 THEN GCOL 0,c:P
LOT 69,x,y:PLOT 69,x,y+4
1880  c=c+1
1890  IF c=15 THEN c=1
1900 UNTIL POINT(x,y)=15
1910 FOR x=x TO 0 STEP -8
1920  y=y-1.5
1930  GCOL 0,c
1940  PLOT 69,x,y
1950  PLOT 69,x,y+4
1960  c=c+1
1970  IF c=15 THEN c=1
1980 NEXT
1990 c=oc
2000 FOR p=-1.05 TO 2.09 STEP 0.52
2010  MOVE ox,oy
2020  x=ox+25*SIN(p)
2030  y=oy+25*COS(p)
2040  GCOL 0,c
2050  DRAW x,y
2060  c=c+1
2070  IF c=15 THEN c=1
2080 NEXT
2090 *SAVE"WatrScr" 3000 8000
2100 END
```

Listing Info7

```
  10 REM     >!RunImage (Info7)
  20 REM     Icon bar *Dismount command
  30 REM By  Robert Adamson
  40 REM For 32-bit machines
  50 REM (c) BAU August 1993
  60 :
  70 taskname$="Dismounter"
  80 DIM q% &100,menubuf% &100,template
s% &500,indir% &300
  90 SYS "Wimp_Initialise",200,&4B53415
4,taskname$
 100 ON ERROR PROCfatalerror(taskname$,
REPORT$,ERL,ERR)
 110 PROCinit
 120 ON ERROR PROCerror(taskname$,REPOR
T$,ERL,ERR)
 130 WHILE NOT quit%
 140  SYS "Wimp_Poll",&1FDBB,q% TO r%
 150  CASE r% OF
 160   WHEN 2:SYS "Wimp_OpenWindow",,q%
 170   WHEN 6:PROCmouse(!q%,q%!4,q%!8,q
%!12,q%!16)
 180   WHEN 9:IF !q%=1 quit%=TRUE
 190   WHEN 17,18:IF q%!16=0 quit%=TRUE
 200  ENDCASE
 210 ENDWHILE
 220 SYS "Wimp_CloseDown"
 230 END
 240 :
 250 DEF PROCmouse(mousex%,mousey%,b%,h
andle%,icon%)
 260 IF handle%=-2 THEN
 270  CASE b% OF
 280   WHEN 1:*ADFS:Mount 0
 290   WHEN 2:SYS "Wimp_CreateMenu",,ma
inmenu%,mousex%-64,184
 300   WHEN 4:*ADFS:Dismount 0
 310  ENDCASE
 320 ENDIF
 330 ENDPROC
 340 :
 350 DEF PROCmakemenu
 360 mainmenu%=menuptr%
 370 menumax%=7
 380 menuptr%!20=44
 390 $menuptr%=taskname$
 400 menuptr%?12=7
 410 menuptr%?13=2
 420 menuptr%?14=7
 430 menuptr%?15=0
 440 maxaddr%=menuptr%+16
 450 menuptr%!24=0
 460 menuptr%+=28
 470 PROCmenuitem("Info",infohand%)
 480 PROCmenuitem("Quit",-1)
 490 menuptr%!-24=(menuptr%!-24) OR &80
 500 !maxaddr%=menumax%*16+32
 510 ENDPROC
 520 :
 530 DEF PROCmenuitem(text$,submenu%)
 540 menuptr%!0=0
 550 menuptr%!4=submenu%
 560 menuptr%!8=&07000021
 570 $(menuptr%+12)=text$
 580 menuptr%+=24
 590 ENDPROC
 600 :
 610 DEF PROCinit
 620 quit%=FALSE
 630 menuptr%=menubuf%
 640 menend%=menubuf%+&100
 650 baricon%=FNbaricon("!dismount",45,
17)
 660 ind%=indir%
 670 SYS "Wimp_OpenTemplate",,"<Obey$Di
r>.Templates"
 680 infohand%=FNcreatewindow("progInfo
")
 690 SYS "Wimp_CloseTemplate"
 700 PROCmakemenu
 710 ENDPROC
 720 :
 730 DEF FNbaricon(spname$,w%,h%)
 740 LOCAL icon%
 750 !q%=-2:q%!4=0
 760 q%!8=0:q%!12=w%*2
 770 q%!16=h%*4
 780 q%!20=&301A
 790 $(q%+24)=spname$+CHR$0
 800 SYS "Wimp_CreateIcon",,q% TO icon%
 810 =icon%
 820 :
 830 DEF FNcreatewindow(name$)
 840 LOCAL hand%
 850 SYS "Wimp_LoadTemplate",,templates
%,ind%,indir%+&2FF,-1,name$,0 TO ,,ind%
 860 templates%!68=10+(10<<16)
 870 SYS "Wimp_CreateWindow",,templates
% TO hand%
 880 =hand%
 890 :
 900 DEF PROCfatalerror(prog$,rep$,erl%
,err%)
 910 !q%=ERR
 920 $(q%+4)=prog$+" has suffered a fat
al error: "+rep$+" (type="+STR$err%+", i
nternal error code: "+STR$erl%+") and mu
st exit immediately."+CHR$0
 930 SYS "Wimp_ReportError",q%,2
 940 SYS "Wimp_CloseDown"
 950 END
 960 ENDPROC
 970 :
 980 DEF PROCerror(prog$,rep$,erl%,err%
)
 990 LOCAL response%
1000 !q%=ERR
1010 $(q%+4)="Unexpected error: "+rep$+
" (Internal error code: "+STR$erl%+"). S
hall I quit?"+CHR$0
1020 SYS "Wimp_ReportError",q%,3 TO ,re
sponse%
1030 quit%=(response%=1)
1040 ENDPROC
```

Listing Info8

```
  10 REM     >DismDat (Info8)
  20 REM     Create files for !Dismount
  30 REM     Files created by Robert Ad
amson
  40 REM For 32-bit machines
  50 REM (c) BAU August 1993
  60 :
  70 free%=(HIMEM-END-&8000) AND &FFFFF
000
  80 DIM q% &100,w% free%
  90 REPEAT
 100  READ file$
 110  IF file$<>"*" THEN
 120   PRINT file$
 130   READ type%,olen%
 140   IF type%=&FFF OR type%=&FFE OR t
ype%=&FEB THEN
 150    out%=OPENOUT(file$)
 160    REPEAT
 170     READ line$
 180     IF line$<>"*" BPUT#out%,line$
 190    UNTIL line$="*"
 200    CLOSE#out%
 210    SYS "OS_File",18,file$,type%
 220   ELSE
 230    line%=0
 240    d$=""
```

```
 250    i%=Ø
 260    WHILE i%<olen%
 270     b$=FNc
 280     IF b$>="a" AND b$<="z" THEN
 290      off%=-EVAL("&"+FNc+FNc)
 300      FOR k%=Ø TO (ASC(b$)-ASC"a"+2
)
 310       w%?i%=w%?(i%+off%)
 320       i%+=1
 330      NEXT
 340     ELSE
 350      w%?i%=EVAL("&"+b$+FNc)
 360      i%+=1
 370     ENDIF
 380    ENDWHILE
 390    SYS "OS_File",1Ø,file$,type%,,w
%,w%+olen%
 400   ENDIF
 410  ENDIF
 420 UNTIL file$="*"
 430 END
 440 :
 450 DEF FNc
 460 LOCAL c$
 470 IF d$="" THEN
 480  READ d$,ch$
 490  line%+=1
 500  $q%=d$
 510  SYS "OS_CRC",Ø,q%,q%+LEN(d$),1 TO
 crc%
 520  IF crc%<>EVAL("&"+ch$) PRINT"Erro
r in data line ";line%:END
 530 ENDIF
 540 c$=LEFT$(d$,1)
 550 d$=MID$(d$,2)
 560 =c$
 570 :
 580 DATA "!Run",&FEB,&54
 590 DATA WimpSlot -min 16k -max 16k
 600 DATA IconSprites <Obey$Dir>.!Sprit
es
 610 DATA Run <Obey$Dir>.!RunImage
 620 DATA *
 630 DATA "Templates",&FEC,&205
 640 DATA FFFFFFFFØØØØØØØØaØ4cØ72,B37F
 650 DATA CaØDD9Ø1ØØØØØ1a157Ø726F,2435
 660 DATA 67496E666FØDe219Øa2918a,B2A8
 670 DATA 1CFAØ2ØØØØECb21e39b4412,754F
 680 DATA ØØØØ84Ø7Ø2Ø7Ø1ØCØEa1Db4,F419
 690 DATA 8a596AdØBØØ3Db4D3Ød54b6,8964
 700 DATA C78a6Øb7813a79Ø9a7D9Aa8,3219
 710 DATA 198a8966a58C8a913D61ØØØ,7283
 720 DATA 78Be2428e2ØCCe2ØFCe2Ø9D,F1D1
 730 DATA m2Ø64e4Ø94e4ØA8m4Ø3Øe6Ø,4Ø78
 740 DATA 6Øe6ØB7e841Es2Ø8ØØ7C8i2,9862
 750 DATA Ø3BaFFDØaE5bA8F8aED39ØØ,3EB
 760 DATA ØØ174E616D653AØD6C65643,38Ø5
 770 DATA EØDFEØEaF29Ce2ØC4e2Ø5Ø7,A795
 780 DATA 5727Ø6F73a23a2Øb6468e4Ø,AA67
 790 DATA 9Øe4Ø417574686F723AØDf4,98B2
 800 DATA Ø38e6ØbAØb6Ø56657273696,B37C
 810 DATA F6Ec4Ø41626F75742Ø74686,4871
 820 DATA 97325Ø726F6772616DØD46,1D7D
 830 DATA 6C6F7Ø7Ø792Ø4469736D6F7,83ØA
 840 DATA 56E746572ØDhØBØD526F626,9841
 850 DATA 5727420416461 6D736F6EØD,4546
 860 DATA 312E3Ø322Ø2831322D4D617,D44A
 870 DATA 22D393329n1129ØD,45C9
 880 DATA "!Sprites",&FF9,&368
 890 DATA Ø1ØØØØØØ1ØaØ46CØ3ØØØØ5C,32B5
 900 DATA aØ4216469736D6F756E74a1,7C71
 910 DATA 8Ø5e1Ca23ØØ13a282Ca2CC4,A56Ø
 920 DATA a31ØCc14Ø4e1Ab211Ø4444Ø,1Ø2B
 930 DATA 2fØF7547a4Bc364Ø7777777,DFDB
 940 DATA 77757d427377776735c4D5Ø,27D1
 950 DATA 775745333355764 7b5B2Øc2,3D4C
 960 DATA 4cØBØØ32c6C6Ø77a5A1Ø717,78A3
 970 DATA 7Ø372g192Øb853Ø77Ø7bØ6Ø,FEE9
 980 DATA 3ØØ1Ø76b585555bØ734aBE7,C16D
 990 DATA 727eA47Øc7Øc75Ø416ØØØØd,317F
1000 DATA 61c3Ah1841ØØ53767767bF6,2DDB
1010 DATA gA1aA667ØØ74b26f49ØØ747,E724
1020 DATA 7444444Ø4ØØ7457ØØ77b91g,D91Ø
1030 DATA DC61dCD1Ø76Ø167aFE31fFF,1ØE6
1040 DATA ØØb27cDBØ754h14cDEe82Ø4,2165
1050 DATA 3ØcFBAØAAcØ6AAAA75AAAAA,A2FB
1060 DATA AAAAAAA6AA4AAAAØAf18b13,1AØ9
1070 DATA 74d187Aa18b19a3Øa2Da2C4,83BØ
1080 DATA 7d3Ød07ØAe15d44hØBAAØAF,74Ø5
1090 DATA ØFFØØFFFFFFFFaØ4bØ7ØØØØ,9BDA
1100 DATA FØFFFFØFbEBFØFFaØAg17eØ,1BC4
1110 DATA Cc18i2Fg23m18c2Ab4CØFn1,27A2
1120 DATA 8e64r18c66c6Aj92a9DØFaA,32A2
1130 DATA 2a98n7DFFØFh6B13ØbBAc3Ø,C3D7
1140 DATA m49b91d181AEa4Ød6Ø149ØF,22A8
1150 DATA dC4eCBmDDr48b31cA8nF4a4,DØF6
1160 DATA AaCØqF3ØFr15dC4FF,28D1
1170 DATA *
```

Listing Info9

```
 10 REM     >Wring (Info9)
 20 REM By  Albert Hoekstra
 30 REM For all machines
 40 REM (c) BAU August 1993
 50 :
 60 r=42Ø
 70 s=1
 80 q=1
 90 delta=Ø.3
100 k=1/2/delta
110 m=1/delta-1
120 yØ=r/k
130 lyØ=r*(1-delta)/m
140 dr=delta*r
150 MODE 1
160 VDU 29,64Ø;512;
170 VDU 19,2,4,Ø,Ø,Ø
180 GCOL Ø,1
190 GCOL Ø,(128+7)
200 CLG
210 FOR q=1 TO -1 STEP -2
220  MOVE -r*q,dr*q
230  FOR y=Ø TO -yØ*q STEP -s*q
240   xl=-FNx(y)*q
250   DRAW xl,y
260   IF INT(y/s/2)<>y/s/2 THEN DRAW x
l,y+dr*q:MOVE xl,y
270  NEXT y
280  FOR y=-yØ*q TO yØ*q STEP s*q
290   DRAW FNx(y)*q,y
300  NEXT y
310  yb=lyØ*q
320  FOR y=yb TO Ø STEP -s*q
330   xl=-FNlx(y)*q
340   yl=y+dr*q
350   DRAW xl,yl
360   IF INT((yl-yb)/s/2)=(yl-yb)/s/2
THEN 400
370   IF ABS(y)>dr/2 THEN lijn=dr*q EL
SE lijn=2*y
380   DRAW xl,yl-lijn
390   MOVE xl,yl
400  NEXT y
410  FOR y=Ø TO -lyØ*q STEP -s*q
420   xl=-FNlx(y)*q
430   yl=y+dr*q
440   DRAW xl,yl
450  NEXT y
460  FOR y=-lyØ*q TO -dr/2*q STEP s*q
470   DRAW FNlx(y)*q,y+dr*q
480  NEXT y
490  VDU 29,64Ø;(512+dr);
500  GCOL Ø,2
510 NEXT
520 END
530 :
540 DEF FNx(y)=SQR(r^2-(k*y)^2)
550 :
560 DEF FNlx(y)
570 xxx=((r-dr)^2-(m*y)^2)
580 IF xxx<1E-4 xxx=Ø
590 =SQR(xxx)
```

Listing Info10

```
  10 REM     >OnTimeSrc (Info1Ø)
  20 REM     Display the time on the Ri
sc OS 3 welcome banner
  30 REM By  Paul Clifford
  40 REM For Risc OS 3
  50 REM (c) BAU August 1993
  60 :
  70 DIM code% 1ØØØ
  80 FOR pass%=%11ØØ TO %111Ø STEP 2
  90 P%=Ø:O%=code%:L%=code%+1ØØØ
 100 [         opt     pass%
 110           equd    Ø
 120           equd    initialise
 130           equd    finalise
 140           equd    service
 150           equd    title
 160           equd    help
 170           equd    Ø
 180           equd    Ø
 190           equd    Ø
 200           equd    Ø
 210           equd    Ø
 220 .title
 230           equs    "WelcomeTime"+CHR$
(Ø)
 240           align
 250 .help
 260           equs    "WelcomeTime"+CHR$
(9)
 270           equs    "1.Ø1 (12 Mar 1993
) by Paul Clifford"+CHR$(Ø)
 280           align
 290 .initialise
 300           stmfd   r13!,{rØ-r7 ,r14}
 310           bl      change_time
 320           adr     rØ,resources
 330           swi     "XResourceFS_Regis
terFiles"
 340           ldmfd   r13!,{rØ-r7 ,pc}
 350 .finalise
 360           stmfd   r13!,{rØ-r7 ,r14}
 370           adr     rØ,resources
 380           swi     "XResourceFS_Dereg
isterFiles"
 390           ldmfd   r13!,{rØ-r7 ,pc}
 400 .service
 410           cmpne   r1,#&49
 420           beq     change_time
 430           cmp     r1,#&6Ø
 440           beq     point_to_resources
 450           mov     pc,r14
 460 .change_time
 470           stmfd   r13!,{rØ-r3 ,r14}
 480           adr     r1,time_block
 490           mov     rØ,#3
 500           strb    rØ,[r1]
 510           mov     rØ,#14
 520           swi     "OS_Word"
 530           mov     rØ,r1
 540           adr     r1,time_start
 550           mov     r2,#time_end-time_
start
 560           adr     r3,time_state
 570           swi     "OS_ConvertDateAnd
Time"
 580           mov     rØ,#1Ø
 590           strb    rØ,time_end-1
 600           ldmfd   r13!,{rØ-r3 ,pc}
 610 .time_block
 620           equd    Ø
 630           equb    Ø
 640 .time_state
 650           equs    "%12:%mi:%se %pm"+
CHR$(Ø)
 660           align
 670 .point_to_resources
 680           adr     rØ,resources
 690           mov     r14,pc
 700           mov     pc,r2
 710 .resources
 720           equd    blank-P%
 730           equd    &ffffff43
 740           equd    &d48fb688
 750           equd    file_end-file_star
t
 760           equd    3
 770           equs    "Resources.Desktop
.Messages"+CHR$(Ø)
 780           align
 790           equd    4+file_end-file_st
art
 800 .file_start
 810           equs    "RO3:RISC OS 3"+CH
R$(1Ø)
 820           equs    "CopyRt:"+CHR$(169
)+" Acorn Computers Ltd, 1992"+CHR$(1Ø)
 830           equs    "Init:Welcome, the
 time is now "
 840 .time_start
 850           equs    "xx:xx:xx xx"
 860           equb    1Ø
 870 .time_end
 880           equs    "Pre:"+CHR$(1Ø)
 890           equs    "Alarm:%Run Resour
ces:$.Apps.!Alarm"+CHR$(1Ø)
 900           equs    "Calc:%Run Resourc
es:$.Apps.!Calc"+CHR$(1Ø)
 910           equs    "Chars:%AddTinyDir
 Resources:$.Apps.!Chars"+CHR$(1Ø)
 920           equs    "Config:%Run Resou
rces:$.Apps.!Configure"+CHR$(1Ø)
 930           equs    "Draw:%Run Resourc
es:$.Apps.!Draw"+CHR$(1Ø)
 940           equs    "Edit:%Run Resourc
es:$.Apps.!Edit"+CHR$(1Ø)
 950           equs    "Help:%Run Resourc
es:$.Apps.!Help"+CHR$(1Ø)
 960           equs    "Paint:%Run Resour
ces:$.Apps.!Paint"+CHR$(1Ø)
 970           equs    "Desktop:Desktop"+
CHR$(1Ø)
 980 .file_end
 990           align
1000 .blank
1010           equd    Ø
1020 ]
1030 NEXT pass%
1040 :
1050 SYS "OS_File",1Ø,"OnTime",&ffa,,co
de%,O%
```

Listing Info11

```
 10 REM     >Griddle (Info11)
 20 REM By  Andrew Clover
 30 REM For all machines
 40 REM (c) BAU August 1993
 50 :
 60 INPUTs:m=1:MODE4:VDU23;82Ø2;Ø;Ø;Ø;
:FORa=1TOs:z=RND(9):FORb=ØTO128ØSTEPz*4+
4:GCOL4,1:MOVEb,Ø:DRAWb,1Ø24:MOVEØ,b:DRA
W128Ø,b:NEXT:NEXT:a$="":REPEATREPEAT:g$=
GET$:g=VALg$:UNTILg$=STR$g AND INSTR(a$,
g$)=Ø:FORa=ØTO128ØSTEPg*4+4:MOVEa,Ø:DRAW
a,1Ø24:MOVEØ,a:DRAW128Ø,a:NEXT:a$=RIGHT$
(a$+g$,m):UNTIL FALSE
```

Listing Info12

```
 10 REM     >Fruit (Info12)
 20 REM By  DCA
 30 REM For 32-bit machines
 40 REM (c) BAU August 1993
 50 :
 60 r$="RAM:£*":SYS8,5,r$TOe,,,p:p=e*p
+5-5*e:DIMr 99:w=&4ØØCØ:SYSw,2ØØ,&4B5341
54,PAGE:r?3=13:FORj=-36TO-9:i=2+j MOD(j/
9):r?i=7ANDRND:SYS8,11,"RAM:"+STR$i,NOTr
?i:SYS66TOt:SYSw+33,,r+4,t+15:NEXT:p-=1-
SGNINSTR($r,CHR$Ø)+3*(?r=r?1)+?r*(LEFT$(
$r)=RIGHT$($r,2)):SYS41,27,r$,,2:SYSw+29
:IFp SYS8,,LEFT$(r$)+STR$p,-128Ø,p,PAGE,
TOP
```

Listing Info13

```
 10 REM     >Fans (Info13)
 20 REM By  Pavlos Record
 30 REM For 32-bit machines
 40 REM (c) BAU August 1993
 50 :
 60 PRINT "(F)ixed or (R)andom :";
 70 CASE GET$ OF
 80
 90  WHEN "F","f":
100 MODE12:OFF:r=128:f=4:FORx=ØTO4:FOR
y=ØTO3:ORIGINx*256+r,y*256+r:d=SGNRND:a=
RND(36)*1Ø:FORc=1TO15*f:GCOL(c MOD15)+1:
MOVEØ,Ø:MOVEr*SINRADa,r*COSRADa:a+=d*24/
f:PLOT85,r*SINRADa,r*COSRADa:NEXT,,:b=1:
REPEATWAIT:FORa=1TO15:COLOURa,b*16,b*16,
Ø:b+=1:NEXT:UNTILØ
110
120  WHEN "R","r":
130 MODE12:OFF:FORi=1TO6Ø:ORIGINRND(12
8Ø),RND(1Ø24):r=64+RND(128):s=r+4:f=RND(
5):d=SGNRND:a=RND(36)*1Ø:FORo=ØTO1:FORc=
1TO15*f:GCOLo*((c MOD15)+1):MOVEØ,Ø:MOVE
r*SINRADa,r*COSRADa:a+=d*24/f:PLOT85,r*S
INRADa,r*COSRADa:NEXT:r-=4:NEXT,:b=1:REP
```

```
EATWAIT:FORa=1TO15:COLOURa,b*16,b*16,0:b
+=1:NEXT:UNTIL0
  140
  150 ENDCASE
```

Listing Info14

```
   10 REM     >MemSpeed (Info14)
   20 REM By  Nick Craig-Wood
   30 REM For 32-bit machines
   40 REM (c) BAU August 1993
   50 :
   60 cycles=25000
   70 fudge=1.25
   80 PROCcode
   90 at%=@%
  100 :
  110 ON ERROR @%=at%:PROCcache(TRUE):PR
INTREPORT$;" at line ";ERL:END
  120 n=0
  130 sum=0
  140 REPEAT
  150  speed=FNmemspeed
  160  sum+=speed
  170  n+=1
  180  @%="g10.9"
  190  PRINT "Average = ";INT(sum/n);"Hz
   This test = ";INT(speed);" Hz"
  200  @%="f10.3"
  210  PRINT "  Rounded = ";sum/n/100000
0;"Mhz"
  220 UNTIL INKEY$(0)<>""
  230 END
  240 :
  250 DEF PROCcache(state)
  260 IF FNarm3 THEN
  270  IF state THEN
  280   *Cache On
  290  ELSE
  300   *Cache Off
  310  ENDIF
  320 ENDIF
  330 ENDPROC
  340 :
  350 DEF FNarm3
  360 SYS "XOS_SWINumberFromString","Cac
he_Flush" TO ;f%
  370 =(f% AND 1)<>0
  380 :
  390 DEF FNmemspeed
  400 PROCcache(FALSE)
  410 PROCpause(20)
  420 time=USR(timetrial)
  430 PROCpause(20)
  440 PROCcache(TRUE)
  450 =fudge*cycles/((65535-time)/2E6)
  460
  470 DEF PROCpause(t%)
  480 t%+=TIME:REPEAT:UNTIL TIME>t%
  490 ENDPROC
  500 :
  510 DEF PROCcode
  520 t1low=  &50
  530 t1high= &54
  540 t1go=   &58
  550 t1latch=&5C
  560 codesize=256*1024
  570 DIM code codesize
  580 sp=13:link=14:pc=15
  590 pass=8
  600 P%=code:L%=code+codesize
  610 [OPT pass
  620
  630 .timetrial
  640    STMFD (sp)!,{link }
  650    SWI   "OS_EnterOS"
  660
  670    MOV   R0,#%00000<<8
  680    MOV   R1,#%11111<<8
  690    SWI   "OS_UpdateMEMC"
  700
  710    SWI   "OS_IntOff"
  720
  730    MOV   R12,#&3200000
  740
  750    MOV   R0,#&FF
  760    STRB  R0,[R12,#t1low]
  770    STRB  R0,[R12,#t1high]
  780
  790    STRB  R0,[R12,#t1go]
  800 ]
  810 FOR i%=1 TO cycles
  820 [OPT pass
  830    ADD   R0,R0,#1
  840 ]
  850 IF (i% MOD 100)=0 PRINTcycles-i%;C
HR$13;
  860 NEXT i%
  870 [OPT pass
  880    STRB  R0,[R12,#t1latch]
  890
  900    LDRB  R0,[R12,#t1low]
  910    LDRB  R1,[R12,#t1high]
  920    ORR   R11,R0,R1,lsl#8
  930
  940    MOV   R0,#%11101<<8
  950    MOV   R1,#%11111<<8
  960    SWI   "OS_UpdateMEMC"
  970
  980    TEQP  pc,#0
  990    MOV   R0,R0
 1000
 1010    MOV   R0,R11
 1020    LDMFD (sp)!,{pc }^
 1030 ]
 1040 ENDPROC
```

BIO (page 93)

Listing Bio1

```
   10 REM     >!RunImage (Bio1)
   20 REM     Bio+ file processor
   30 REM By  Dave Acton & Dave Lawrence
   50 REM (c) BAU February & August 1993
   60 :
  280 PROCclose_down
  330 DIM temp% &100,ic% 64,mess% &100,p
ixtrans% &100,scale% 16
  370 type_def$="in/k,out=results/k,dire
ctory=dir/s,send/s,window/s"
  541 PROCload_palettes
  600 IF (lib_flags%(i%) AND 40)>0 THEN
  611  IF (lib_flags%(i%) AND 32)>0 THEN
 q%!28=q%!28 OR (%1111111<<24)
  841 xdragstart%=FNswi("XDragASprite_St
art")
  842 save_proc%=-1
 1751 wind_out%=(q%!16<>0)
 1890 lib_flags%(i%)=(files_in% AND 1) O
R (dirs_in% AND 2) OR (files_out% AND 4)
 OR (data_out% AND 8) OR (send_out% AND
16) OR (wind_out% AND 32)
 2200 ic%!12=FNsprite_width(lib_spr%(pro
c%,icon%))
 2210 ic%!16=FNsprite_height(lib_spr%(pr
oc%,icon%))
 3921 IF (b% AND 2)>0 AND handle%<>-2 PR
OCopen_spr_save(mousex%,mousey%,handle%)
 4421 WHEN &502:PROCint_help
 4422 WHEN 9:PROCpalette_change
 4530 =FNfind_elem(ic%!12,wind_hand%())
OR FNfind_elem(ic%!12,result_hand%())
 4701 IF result_open%(proc%) PROCclose(r
esult_hand%(proc%))
 4702 IF save_proc%<>-1 PROCclose(save_h
and%)
 4741 makes_window%=(lib_flags%(proc%) A
ND 32)>0
 4861 claimed%=FALSE
 4871 IF claimed% PROCrelease_memory
 4872 IF makes_window% THEN
 4873 IF spr_base%<>0 THEN SYS "XOS_Spri
teOp",&13C,spr_base%,0,1 ELSE z=TRUE
 4874 ENDIF
 5029    window_title$="Result"
 5030    PROCopen_save(x-64,y-64,lib_out
%(proc%),proc%)
 5031   ENDIF
 5040  WHEN makes_window%:PROCopen_outpu
t(proc%,spr_base%)
 5111 window_title$="Result"
 5120 PROCopen_save(x-64,y-64,lib_out%(c
ur_proc%),cur_proc%)
 5370 DEF PROCopen_save(x%,y%,type%,p%)
 5391 $savetext=window_title$
 5511 save_proc%=p%
 5541 IF xdragstart%<>-1 SYS "XDragASpri
te_Stop"
 5581 IF (lib_flags%(save_proc%) AND 32)
>0 THEN
 5582 q%!40=&FF9
 5583 q%!36=spritesize%+20
 5584 ELSE
 5601 ENDIF
 6000 IF xdragstart%<>-1 AND (FNread_cmo
s(28) AND 2)>0 THEN SYS xdragstart%,%110
00101,1,$(savetype+1),q%+8,q%+24 ELSE SY
S "Wimp_DragBox",,q%
 6110 PROCsave_it
 6320 IF hand%=save_hand% SYS "XOS_File"
,6,junk$:save_proc%=-1
 6350 IF proc%>0 PROCclose2
 6401 IF (lib_flags%(proc%) AND 32)>0 PR
OCredraw_output(hand%,proc%):ENDPROC
 7450 :
 7460 DEF FNsprite_width(spr%)
 7470 LOCAL width%,mode%
 7480 SYS "OS_SpriteOp",&228,lib_sprites
%,spr% TO ,,,width%,,,mode%
 7490 =width%<<FNvar(mode%,4)
 7500 :
 7510 DEF FNsprite_height(spr%)
 7520 LOCAL height%,mode%
 7530 SYS "OS_SpriteOp",&228,lib_sprites
%,spr% TO ,,,,height%,,mode%
 7540 =height%<<FNvar(mode%,5)
 7550 :
 7560 DEF FNvar(mode%,var%)
 7570 LOCAL v%
 7580 SYS "OS_ReadModeVariable",mode%,va
r% TO ,,v%
 7590 =v%
 7600 :
 7610 DEF PROCint_help
 7620 mess%!12=mess%!8
 7630 mess%!16=&503
 7640 help$=FNget_help_text(mess%!32,mes
s%!36)
 7650 $(mess%+20)=LEFT$(help$,232)
 7660 !mess%=(LEN help$+25) AND NOT 3
 7670 SYS "Wimp_SendMessage",17,mess%,me
ss%!4
 7680 ENDPROC
 7690 :
 7700 DEF FNget_help_text(window%,icon%)
 7710 LOCAL help$,i%
 7720 CASE window% OF
 7730 WHEN -2:
 7740  i%=FNfind_elem(icon%,proc_icon%()
)
 7750  IF i%=0 THEN
 7760   help$="This is the BIO icon. The
re are currently no BIO modules running"
 7770  ELSE
 7780   help$="This is the "+lib_name$(i
%)+" icon.|M"+FNhelp(-1,-1,lib_proc$(i%)
)
 7790  ENDIF
 7800 WHEN info_hand%:
 7810  help$="This window displays infor
mation about BIO."
 7820 WHEN save_hand%
 7830  CASE icon% OF
 7840   WHEN -1:help$="This box allows y
ou to save your edited file."
 7850   WHEN 0:help$="Click here to save
 the data with the current filename. If
it is not a full pathname, you must drag
 the icon to a directory first."
 7860   WHEN 1:help$="Drag this icon to
the directory in which you want to save
the file. Or, drag it to the program int
o which you want to transfer the data."
 7870   WHEN 2:help$="This shows the fil
ename for this data. If it is not a full
 pathname, drag the icon into a director
y display."
 7880  ENDCASE
 7890 OTHERWISE
 7900 i%=FNfind_elem(window%,wind_hand%(
))
 7910 IF i%>0 THEN
 7920  help$="This is the "+lib_name$(i%
)+" set up window|M"+FNhelp(window%,icon
%,lib_proc$(i%))
 7930 ELSE
 7940  i%=FNfind_elem(window%,result_han
d%())
 7950  help$="This is the output from "+
lib_name$(i%)+"|M"+FNhelp(1,-1,lib_proc$
(i%))
 7960 ENDIF
 7970 ENDCASE
 7980 =help$
 7990 :
 8000 DEF FNhelp(window%,icon%,module$)
 8010 LOCAL h$
 8020 LOCAL ERROR
 8030 ON ERROR LOCAL RESTORE ERROR:=""
 8040 h$=EVAL("FN"+module$+"_help(window
%,icon%)")
 8050 RESTORE ERROR
 8060 =h$
 8070 :
 8080 DEF FNhelp_on_icon(window%,icon%,h
1$,h2$)
 8090 IF FNbutton_state(window%,icon%)=0
 THEN =h1$ ELSE =h2$
 8100 :
 8110 DEF FNswi(swi$)
 8120 LOCAL swi%,ok%
 8130 SYS "XOS_SWINumberFromString",,swi
$ TO swi%;ok%
 8140 IF (ok% AND 1)>0 swi%=-1
 8150 =swi%
 8160 :
 8170 DEF FNread_cmos(byte%)
 8180 SYS "OS_Byte",161,byte% TO ,,byte%
 8190 =byte%
 8200 :
 8210 DEF PROCclose_down
 8220 IF running%>0 THEN
 8230 FOR i%=1 TO running%
 8240  proc%=running%(i%)
 8250  IF result_open%(proc%) PROCclose(
result_hand%(proc%))
 8260 NEXT
 8270 ENDIF
 8280 SYS "Wimp_CloseDown"
 8290 ENDPROC
 8300 :
 8310 DEF PROCload_palettes
 8320 SYS "OS_File",5,"<Bio$Dir>.Palette
s" TO ,,,,plen%
 8330 DIM palettes% plen%+16
 8340 !palettes%=plen%+16
 8350 palettes%!8=16
 8360 SYS "XOS_SpriteOp",&109,palettes%
 8370 SYS "XOS_SpriteOp",&10A,palettes%,
"<Bio$Dir>.Palettes"
 8380 ENDPROC
 8390 :
 8400 DEF PROCopen_spr_save(x%,y%,handle
%)
 8410 LOCAL proc%
 8420 proc%=FNfind_elem(handle%,result_h
and%())
 8430 IF proc%<>0 THEN
 8440 IF (lib_flags%(proc%) AND 32)>0 PR
OCopen_save(mousex%-64,mousey%-64,&FF9,p
roc%)
 8450 ENDIF
 8460 ENDPROC
 8470 :
 8480 DEF PROCpalette_change
 8490 LOCAL i%,proc%
 8500 FOR i%=1 TO running%
 8510 proc%=running%(i%)
 8520 IF result_open%(proc%) AND (lib_fl
ags%(proc%) AND 32)>0 PROCforce_redraw(r
esult_hand%(proc%))
 8530 NEXT
```

```
8540 ENDPROC
8550 :
8560 DEF PROCforce_redraw(hand%)
8570 SYS "Wimp_ForceRedraw",hand%,-1E8,-1E8,1E8,1E8
8580 ENDPROC
8590 :
8600 DEF FNcreate_window(mode%,xres%,yres%,name$)
8610 IF xres%<0 xres%=-xres% ELSE xres%=xres%>>FNvar(mode%,4)
8620 IF yres%<0 yres%=-yres% ELSE yres%=yres%>>FNvar(mode%,5)
8630 spr_base%=FNmake_a_sprite(name$,xres%,yres%,mode%)
8640 IF spr_base%=0 THEN
8650 PROCwarn("Not enough RMA to create window")
8660 ELSE
8670 SYS "XOS_SpriteOp",&13C,spr_base%,name$
8680 window_title$=name$
8690 ENDIF
8700 =spr_base%
8710 :
8720 DEF FNmake_a_sprite(sprn$,sprx%,spry%,sprm%)
8730 IF sprm%=3 OR sprm%=6 OR sprm%=7 THEN =0
8740 pals%=FNvar(sprm%,3)+1
8750 log2bpp%=FNvar(sprm%,10)
8760 spritesize%=spry%*(((sprx%<<log2bpp%)+31)ANDNOT31) DIV 8+44+pals%*8
8770 SYS "XOS_Module",6,,,spritesize%+20 TO ,,rma%;ok
8780 IF (ok AND 1)>0 THEN =0
8790 !rma%=spritesize%+20
8800 rma%!8=16
8810 SYS "XOS_SpriteOp",&109,rma%
8820 SYS "XOS_SpriteOp",&10F,rma%,sprn$,1,sprx%,spry%,sprm%
8830 PROCcopy_palette(palettes%,STR$pals%,rma%,sprn$)
8840 =rma%
8850 :
8860 DEF PROCcopy_palette(base1%,spr1$,base2%,spr2$)
8870 LOCAL i%,a%,b%,c%
8880 SYS "XOS_SpriteOp",&125,base1%,spr1$,-1 TO ,,,c%,b%
8890 SYS "XOS_SpriteOp",&125,base2%,spr2$,-1 TO ,,,,a%
8900 FOR i%=0 TO c%*8-1 STEP 4
8910 a%!i%=b%!i%
8920 NEXT
8930 ENDPROC
8940 :
8950 DEF PROCdesktop_palette
8960 LOCAL i%,pals%
8970 SYS "OS_SpriteOp",&128,spr_base%,window_title$ TO ,,,,,,sprm%
8980 pals%=FNvar(sprm%,3)+1
8990 IF pals%=4 OR pals%=16 PROCcopy_palette(palettes%,STR$pals%+"w",spr_base%,"Output")
9000 ENDPROC
9010 :
9020 DEF PROCcurrent_palette
9030 LOCAL entries%,palette%
9040 SYS "XOS_SpriteOp",&125,spr_base%,window_title$,-1 TO ,,,entries%,palette%
9050 IF entries%<>64 THEN
9060 FOR i%=0 TO entries%-1
9070  SYS "OS_ReadPalette",i%,16 TO ,,palette%!(i%*8)
9080 NEXT i%
9090 ENDIF
9100 ENDPROC
9110 :
9120 DEF PROCvdu19(c%,r%,g%,b%)
9130 LOCAL entries%,palette%
9140 SYS "XOS_SpriteOp",&125,spr_base%,window_title$,-1 TO ,,,entries%,palette%
9150 IF c%<entries% palette%!(c%*8)=16 OR (r%<<8) OR (g%<<16) OR (b%<<24)
9160 ENDPROC
9170 :
9180 DEF PROCsave_it
9190 IF (lib_flags%(save_proc%) AND 32)<>0 THEN
9200 SYS "XOS_SpriteOp",&10C,result_open%(save_proc%),save$
9210 ELSE
9220 SYS "OS_FSControl",26,junk$,save$,&82
9230 ENDIF
9240 ENDPROC
9250 :
9260 DEF PROCclose2
9270 IF (lib_flags%(proc%) AND 32)>0 AND result_open%(proc%)<>0 THEN
9280 SYS "OS_Module",7,,result_open%(proc%)
9290 IF save_proc%<>-1 THEN
9300  !q%=save_hand%
9310  SYS "Wimp_CloseWindow",,q%
9320  save_proc%=-1
9330 ENDIF
9340 ENDIF
9350 result_open%(proc%)=FALSE
9360 ENDPROC
9370 :
9380 DEF PROCredraw_output(hand%,proc%)
9390 LOCAL i%,more%,ax0%,ay0%
9400 SYS "XOS_SpriteOp",&128,result_open%(proc%),window_title$ TO ,,,,spry%,,mode%
9410 xeig%=FNvar(mode%,4)
9420 yeig%=FNvar(mode%,5)
9430 SYS "ColourTrans_SelectTable",result_open%(proc%),window_title$,-1,-1,pixtrans%,%00
9440 !scale%=1<<xeig%
9450 scale%!4=1<<yeig%
9460 scale%!8=1<<FNvar(MODE,4)
9470 scale%!12=1<<FNvar(MODE,5)
9480 SYS "Wimp_RedrawWindow",,q% TO more%
9490 ax0%=q%!4-q%!20
9500 ay0%=q%!16-q%!24-(spry%<<yeig%)
9510 WHILE more%
9520 SYS "XOS_SpriteOp",&134,result_open%(proc%),window_title$,ax0%,ay0%,0,scale%,pixtrans%
9530 SYS "Wimp_GetRectangle",,q% TO more%
9540 ENDWHILE
9550 ENDPROC
9560 :
9570 DEF PROCopen_output(proc%,sbase%)
9580 $result_title%(proc%)=window_title$
9590 SYS "XOS_SpriteOp",&128,sbase%,window_title$ TO ,,,sprx%,spry%,,mode%
9600 sprx%=sprx%<<FNvar(mode%,4)
9610 spry%=spry%<<FNvar(mode%,5)
9620 !q%=0
9630 q%!4=-spry%
9640 q%!8=sprx%
9650 q%!12=0
9660 SYS "Wimp_SetExtent",result_hand%(proc%),q%
9670 !q%=result_hand%(proc%)
9680 SYS "Wimp_GetWindowState",,q%
9690 q%!12=q%!4+sprx%
9700 q%!8=q%!16-spry%
9710 q%!28=-1
9720 SYS "Wimp_OpenWindow",,q%
9730 result_open%(proc%)=sbase%
9740 ENDPROC
9750 :
9760 DEF FNclaim_memory(RETURN ptr%,RETURN amount%)
9770 LOCAL mem%
9780 SYS "Wimp_SlotSize",-1,-1 TO wimp_current%,,mem%
9790 SYS "Wimp_SlotSize",wimp_current%+mem%,-1 TO mem%
9800 ptr%=HIMEM
9810 amount%=mem%-ptr%
9820 claimed%=(amount%<>0)
9830 =claimed%
9840 :
9850 DEF PROCrelease_memory
9860 SYS "Wimp_SlotSize",wimp_current%,-1
9870 claimed%=FALSE
9880 ENDPROC
```

Listing Bio2

```
10 REM     >Paldat (Bio2)
20 REM By  dL & DA
30 REM For 32-bit machines
40 REM (c) BAU August 1993
50 :
60 DIM q% &4000
70 REPEAT
80  READ file$
90  IF file$<>"END" THEN
100   PRINTfile$
110   READ type%
120   p%=q%
130   dat$=""
140   WHILE dat$<>"END"
150    ?p%=FNread_byte
160    p%+=1
170    IF dat$="" READ dat$
180   ENDWHILE
190   SYS "OS_File",10,file$,type%,,q%,p%
200  ENDIF
210 UNTIL file$="END"
220 END
230 :
240 DEF FNread_byte
250 LOCAL c$,n%,a%
260 c$=FNread_char
270 IF c$="z" THEN =0
280 IF c$<"a" THEN =EVAL("&"+c$+FNread_char)
290 n%=ASC(c$)-95
300 a%=FNread_byte
310 dat$=STRING$(n%,RIGHT$("0"+STR$~a%,2))+dat$
320 =FNread_byte
330 :
340 DEF FNread_char
350 LOCAL c$
360 IF dat$="" READ dat$
370 c$=LEFT$(dat$,1)
380 dat$=MID$(dat$,2)
390 =c$
400 :
410 DATA Palettes,&FF9
420 DATA 06bz10bz8004az40bz32szfz3Cb
430 DATA z3Cbz19bz10bz10bz10bFF10bFF
440 DATA cz50bz34szbz01bz4Cbz4Cbz1Ab
450 DATA z10bz10bz10FFaz10FFaz10aFFz
460 DATA 10aFFz10bFF10bFFczB0bz3136s
470 DATA zaz03bzACbzACbz1Bbz10bz10bz
480 DATA 10FFaz10FFaz10zFFz10zFFz10a
490 DATA FFz10aFFz10azFF10azFF10FFzFF
500 DATA 10FFzFF10zaFF10zaFF10bFF10b
510 DATA FF11bz12bFF11FFaz12zaFF11zFF
520 DATA z12FFzFF11aFFz12azFF11azFF12
530 DATA aFFz11FFzFF12zFFz11zaFF12FF
540 DATA az11bFF12fz3002az3634szaz07
550 DATA bz2C02az2C02az1Cbz10bz10bz10
560 DATA b1110b1110b2210b2210b3310b33
570 DATA 1044az1044az1055a111055a1110
580 DATA 66a221066a221077a331077a3310
590 DATA az4410az4410a115510a115510a
600 DATA 226610a226610a337710a337710
610 DATA 44z441044z441055115510551155
620 DATA 1066226610662266107733771077
630 DATA 33771088az1088az1099a111099
640 DATA a1110AAa2210AAa2210BBa3310BB
650 DATA a3310CCaz10CCaz10DDa1110DDa
660 DATA 1110EEa2210EEa2210FFa3310FF
670 DATA a331088z441088z441099115510
680 DATA 99115510AA226610AA226610BB33
690 DATA 7710BB337710CCz4410CCz4410DD
700 DATA 115510DD115510EE226610EE2266
710 DATA 10FF337710FF337710z44z10z44
720 DATA z1011551110115511102266221 0
730 DATA 22662210337733103377331 0a44
740 DATA z10a44z10a551110a551110a6622
750 DATA 10a662210a773310a773310za44
760 DATA 10za441011a551011a551022a66
770 DATA 1022a661033a771033a7710b4410
780 DATA b4410b5510b5510b6610b6610b77
790 DATA 10b77108844z108844z10995511
800 DATA 1099551110AA662210AA662210BB
810 DATA 773310BB773310CC44z10CC44z10
820 DATA DD551110DD551110EE662210EE66
830 DATA 2210FF773310FF77331088a4410
840 DATA 88a441099a551099a5510AAa6610
850 DATA AAa6610BBa7710BBa7710CCa4410
860 DATA CCa4410DDa5510DDa5510EEa6610
870 DATA EEa6610FFa7710FFa77czB0bz31
880 DATA 3677szz03bzACbzACbz1BczbF0z
890 DATA bF0zbD0zbD0zbB0zbB0zb90zb90
900 DATA zb70zb70zb50zb50zb30zb30iz40
910 DATA 90az4090zaE0azaE0bzC0bzC0az
920 DATA D0bzD0bzaE0B0zaE0B0z5080az50
930 DATA 80azF0B0azF0B0bzB0F0azB0F001
940 DATA bz50bz3477szaz01bz4Cbz4Cbz1A
950 DATA bz10bz10czb50zb50zbC0zbC010
960 DATA bFF10bFFcz
970 DATA END
980 DATA END
```

Listing Bio3

```
10 REM     >3Ddat (Bio3)
20 REM By  dL & DA
30 REM For 32-bit machines
40 REM (c) BAU August 1993
50 :
60 DIM q% &4000
70 REPEAT
80  READ file$
90  IF file$<>"END" THEN
100   PRINTfile$
110   READ type%
120   p%=q%
130   dat$=""
140   WHILE dat$<>"END"
150    ?p%=FNread_byte
160    p%+=1
170    IF dat$="" READ dat$
180   ENDWHILE
190   SYS "OS_File",10,file$,type%,,q%,p%
200  ENDIF
210 UNTIL file$="END"
220 END
230 :
240 DEF FNread_byte
250 LOCAL c$,n%,a%
260 c$=FNread_char
270 IF c$="z" THEN =0
280 IF c$<"a" THEN =EVAL("&"+c$+FNread_char)
290 n%=ASC(c$)-95
300 a%=FNread_byte
310 dat$=STRING$(n%,RIGHT$("0"+STR$~a%,2))+dat$
320 =FNread_byte
330 :
340 DEF FNread_char
350 LOCAL c$
360 IF dat$="" READ dat$
370 c$=LEFT$(dat$,1)
380 dat$=MID$(dat$,2)
390 =c$
400 :
410 DATA 3DSprites,&FF9
420 DATA 01bz10bz0405azF404az33646772
430 DATA 61706834cz08bz10fz0Fbz2Cbz90
440 DATA 02az0Cszszszszszszszszbz2002
450 DATA szgza22bz20a2202bza2202sz65
460 DATA 6765554555450222a54a55656656
470 DATA qz4265455456463433 23a0242a33
480 DATA 646644555624nz52554555664544
490 DATA 3344a2220224443445466455455
500 DATA 251z324454554534332 3a33b2223
510 DATA 3332233343a55454424jz3234a33
520 DATA 53653533h22a32545535b3323gz
530 DATA 22a333223b2243a34a3323222332
540 DATA b334433b22a32a3302dz22a32a33
550 DATA 2223r2223b333222bz202111a12
560 DATA f22211222211222a122221b2232
570 DATA b2212b21szszszszszszszdzaFF
580 DATA szmzaFFszmzaFFszmzaFFozF00F
590 DATA ozaFFizaFFbzF0aFF0FbzaFF0Fh
600 DATA zaFFhzoFFhzaFFfzsFFfzaFFezs
610 DATA FFaFFezaFFdzsFFcFFdzaFFczsFF
620 DATA eFFczaFFazsFFhFF0FazaFFzsFF
630 DATA kFFzaFFF0sFFkFFzaFFszmzaFFs
640 DATA zmzaFFszmzaFF
650 DATA END
660
670 DATA END
```

Listing Bio4

```
   10 REM     >3dgraph (Bio4)
   20 REM By  dL & DA
   30 REM For 32-bit machines
   40 REM (c) BAU August 1993
   50 :
   60 DEF FN3dgraph_name="3D Graph plotter"
   70 :
   80 DEF FN3dgraph_args="-in text -window"
   90 :
  100 DEF FN3dgraph_init
  110 =0
  120 :
  130 DEF FN3dgraph(in$)
  140 LOCAL a,b,s,x,y,z,zplus,in,table,size,xs,zs,j
  150 IF FNcreate_window(30,1280,512,"Graph")=0 THEN =TRUE
  160 IF FNclaim_memory(table,size)=0 PROCwarn("Out of memory"):=TRUE
  170 in=OPENIN(in$)
  180 func_3dgraph$=GET$#in
  190 CLOSE#in
  200 zplus=30
  210 s=2000
  220 a=table
  230 xs=0.4
  240 zs=0.4
  250 FOR z=10 TO -10 STEP -zs
  260  j=a
  270  PROChourglass(10-z,40)
  280  FOR x=-10 TO 10 STEP xs
  290   |a=FN3dgraph_eval(func_3dgraph$,x,z)-3
  300   a+=5
  310  NEXT
  320  j=a-j
  330 NEXT
  340 b=table
  350 FOR z=10 TO zs-10 STEP -zs
  360  PROChourglass(30-z,40)
  370  a=b
  380  FOR x=-10 TO 10-xs STEP xs
  390   GCOL 2
  400   PROC3dgraph_plot(4,x,|a,z)
  410   PROC3dgraph_plot(4,x+xs,|(a+5),z)
  420   PROC3dgraph_plot(85,x,|(a+j),z-zs)
  430   PROC3dgraph_plot(85,x+xs,|(a+j+5),z-zs)
  440   GCOL 1
  450   PROC3dgraph_plot(5,x,|(a+j),z-zs)
  460   PROC3dgraph_plot(5,x,|a,z)
  470   PROC3dgraph_plot(5,x+xs,|(a+5),z)
  480   PROC3dgraph_plot(5,x+xs,|(a+j+5),z-zs)
  490   a+=5
  500  NEXT
  510  b+=j
  520 NEXT
  530 =0
  540 :
  550 DEF PROC3dgraph_plot(p,x,y,z)
  560 PLOT p,640+s*(x/(z+zplus)),400+s*(y/(z+zplus))
  570 ENDPROC
  580 :
  590 DEF FN3dgraph_eval(f$,x,z)
  600 LOCAL y
  610 LOCAL ERROR
  620 ON ERROR LOCAL RESTORE ERROR:=0
  630 y=EVAL(f$)
  640 RESTORE ERROR
  650 =y
  660 :
  670 DEF FN3dgraph_help(window%,icon%)
  680 LOCAL help$
  690 CASE window% OF
  700  WHEN -1:help$="Drop a text file describing a graph on this icon. The first line should be a function of the form y=f(x,z) for -10<=x<=+10, -10<=z<=+10"
  710  WHEN 1:help$="It is a graph of y="+func_3dgraph$
  720 ENDCASE
  730 =help$
```

Listing Bio5

```
   10 REM >HexHelp (Bio5)
   20 REM Example of interactive help
   30 REM add these lines (but not these REMs!)
   40 REM to the HexDump module from April
  940 :
  950 DEF FNhexdump_help(window%,icon%)
  960 LOCAL help$
  970 IF window%=-1 THEN
  980  help$="Drop any file on this for a hex dump."
  990 ELSE
 1000  CASE icon% OF
 1010   WHEN 2:help$="Enter hex dump width here"
 1020   WHEN 3:help$="Click SELECT to set output format to 'bytes'"
 1030   WHEN 4:help$="Click SELECT to set output format to 'words'"
 1040   WHEN 5:help$="Click SELECT to "+FNhelp_on_icon(window%,icon%,"in","ex")+"clude ASCII text"
 1050   WHEN 7:help$="Enter length of dump block here"
 1060  ENDCASE
 1070 ENDIF
 1080 =help$
```

Listing Bio6

```
   10 REM     >Sortdat (Bio6)
   20 REM By  dL & DA
   30 REM For 32-bit machines
   40 REM (c) BAU August 1993
   50 :
   60 DIM q% &4000
   70 REPEAT
   80  READ file$
   90  IF file$<>"END" THEN
  100   PRINTfile$
  110   READ type%
  120   p%=q%
  130   dat$=""
  140   WHILE dat$<>"END"
  150    ?p%=FNread_byte
  160    p%+=1
  170    IF dat$="" READ dat$
  180   ENDWHILE
  190   SYS "OS_File",10,file$,type%,,q%,p%
  200  ENDIF
  210 UNTIL file$="END"
  220 END
  230 :
  240 DEF FNread_byte
  250 LOCAL c$,n%,a%
  260 c$=FNread_char
  270 IF c$="z" THEN =0
  280 IF c$<"a" THEN =EVAL("&"+c$+FNread_char)
  290 n%=ASC(c$)-95
  300 a%=FNread_byte
  310 dat$=STRING$(n%,RIGHT$("0"+STR$~a%,2))+dat$
  320 =FNread_byte
  330 :
  340 DEF FNread_char
  350 LOCAL c$
  360 IF dat$="" READ dat$
  370 c$=LEFT$(dat$,1)
  380 dat$=MID$(dat$,2)
  390 =c$
  400 :
  410 DATA SrtSprites,&FF9
  420 DATA 01bz10bzE402azD402az73707269
  430 DATA 7465736F727434z04bz10fz07bz
  440 DATA 2Cbz8001az0Cfzh77jz7799aFF0F
  450 DATA bz77jz77FFBFFFz50770777jz77
  460 DATA BFBB0Bz7571z77jz77FFEE0Ez27
  470 DATA 07z77jz77AAEE0Ez1B03z77jz77
  480 DATA aAAazB70Bz77jz77AA0Aaz7B0Bz
  490 DATA 77jzh77szz1101fz6201az623742
  500 DATA 25z2044234326dz207503az7205
  510 DATA 1067106642234323dz336105z10
  520 DATA 76355325611602az03cz41456417
  530 DATA z30371173247313fz1014453437
  540 DATA z7105z71166115az22cz6214z41
  550 DATA 571275454434a1154453321szgz
  560 DATA hFFczbFFczhFFczbFFczhFFczbFF
  570 DATA czhFFczbFFczhFFczbFFczhFFcz
  580 DATA bFFczhFFczbFFczhFFczbFFczhFF
  590 DATA czbFFmzFF0FzbFFbzFF0FazcFFz
  600 DATA F0fFFazF0FF0FazFF0FF0FFF0gFF
  610 DATA azaFF0FzF0eFF0Faz0FbFFzcFFz
  620 DATA F0eFFczbFFF0cFFzFF0FzcFFazFF
  630 DATA zdFFzlFFzbFFpzbFF
  640 DATA END
  650
  660 DATA ~SprSort,&FEC
  670 DATA cFFkz2Cbz2201az01bz53707269
  680 DATA 7465536F72740D71czDA01az4001
  690 DATA az9C02azAC01izcFF12z03870702
  700 DATA 07010301 0CezFCaFFz05ez3Dcz30
  710 DATA az01bz01bz536F72740D746C6564
  720 DATA 3E0D6504bz08bzCCbFFB8bzFCbFF
  730 DATA 13B30117D8bzDEbz0Cbz08bz9Cb
  740 DATA FFB8bzCCbFF13B30117F0bzF8bz
  750 DATA 0Cbz08bz6CbFFB8bz9CbFF13B381
  760 DATA 170A01az1001az0CbzB8bzCCbFF
  770 DATA 6801azFCbFF10azC7415343a490D
  780 DATA 6C65643E0D7F415343a490D5372
  790 DATA 616469a6Fa662C72616469a6F6E
  800 DATA 0D4E756D6572696 30D5372616469
  810 DATA a6Fa662C72616469a6F6E0D4963
  820 DATA 6F6E730D5372616469a6Fa662C72
  830 DATA 616469a6F6E0D
  840 DATA END
  850
  860 DATA END
```

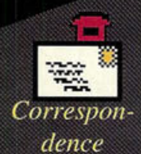
Listing Bio7

```
   10 REM     >SpriteSort .
   20 REM By  dL
   30 REM For 32-bit machines
   40 REM (c) BAU August 1993
   50 :
   60 DEF FNspritesort_name = "Sprite sorter"
   70 DEF FNspritesort_args = "-in Sprite -out Sprite"
   80 :
   90 DEF FNspritesort_init
  100 LOCAL i%
  110 FOR i%=0 TO 1
  120  PROCset_button(wind_hand%,i%,ABS(i%=0))
  130 NEXT
  140 DIM spritesort_code% 256
  150 sp=13:link=14:pc=15
  160 FOR i%=0 TO 2 STEP 2
  170 P%=spritesort_code%
  180 [OPT i%
  190 STMFD   (sp)!,{r0 ,R1,link}
  200 BL      ss_convert
  210 BVS     ss_one_s
  220 MOV     R1,R0
  230 LDR     R0,[sp,#4]
  240 BL      ss_convert
  250 BVS     return_LT
  260 CMP     R1,R0
  270 LDMFD   (sp)!,{r0 ,R1,pc}
  280
  290 .return_LT
  300 CMP     pc,#&7F000000
  310 LDMFD   (sp)!,{r0 ,R1,pc}
  320
  330 .return_GE
  340 CMP     pc,#0
  350 LDMFD   (sp)!,{r0 ,R1,pc}
  360
  370 .ss_one_s
  380 LDR     R0,[sp,#4]
  390 BL      ss_convert
  400 BVC     return_GE
  410 LDR     R2,[sp,#0]
  420 LDR     R3,[sp,#4]
  430 .ss_strcomp
  440 LDRB    R0,[R2],#1
  450 LDRB    R1,[R3],#1
  460 CMP     R0,R1
  470 BEQ     ss_strcomp
  480 LDMFD   (sp)!,{r0 ,R1,pc}
  490
  500 .ss_convert
  510 STMFD   (sp)!,{r1 ,R2,link}
  520 MOV     R1,R0
  530 MOV     R0,#10
  540 SWI     "XOS_ReadUnsigned"
  550 MOV     R0,R2
  560 LDMFD   (sp)!,{r1 ,R2,pc}
  570 ]
  580 NEXT
  590 =0
  600 :
  610 DEF FNspritesort_mouse(mx%,my%,mb%,mh%,mi%)
  620 IF (mb% AND 1) AND FNbutton_state(mh%,mi%)=0 PROCset_button(mh%,mi%,1)
  630 =0
  640 :
  650 DEF FNspritesort(in$,out$)
  660 LOCAL in%,out%,sprites%,next%,last%,off%,memory%,length%
  670 LOCAL available%,poke%,space%,get%,sort%,i%,size%,type%
  680 sort%=FNesg_state(wind_hand%,1)
  690 IF NOT FNclaim_memory(memory%,available%) PROCwarn("Out of memory"):=1
  700 in%=OPENIN(in$)
  710 sprites%=FNwget(in%)
  720 next%=FNwget(in%)-4
  730 last%=FNwget(in%)
  740 size%=sprites%*(16+4)
  750 IF size%>available% PROCwarn("Out of memory"):=1
  760 poke%=memory%
  770 FOR i%=0 TO sprites%-1
  780  PTR#in%=next%
  790  off%=FNwget(in%)
  800  SYS "OS_GBPB",4,in%,poke%,12
  810  poke%!12=next%
  820  poke%+=16
  830  next%+=off%
  840 NEXT i%
  850 IF sort%=0 type%=4 ELSE type%=spritesort_code%
  860 SYS "OS_HeapSort",sprites%,poke% OR (%11<<30),type%,,memory%,16
  870 out%=OPENOUT(out$)
  880 PROCwput(out%,sprites%)
  890 PROCwput(out%,&10)
  900 PROCwput(out%,last%)
  910 space%=memory%+available%-poke%
  920 FOR i%=0 TO sprites%-1
  930  PROChourglass(i%,sprites%)
  940  PTR#in%=memory%!(i%*16+12)
  950  length%=FNwget(in%)-4
  960  PROCwput(out%,length%+4)
  970  REPEAT
  980   IF length%>space% get%=space% ELSE get%=length%
  990   SYS "OS_GBPB",4,in%,poke%,get%
 1000   SYS "OS_GBPB",2,out%,poke%,get%
 1010   length%-=get%
 1020  UNTIL length%=0
 1030 NEXT i%
 1040 CLOSE #in%
 1050 CLOSE #out%
 1060 =0
 1070 :
 1080 DEF FNspritesort_help(window%,icon%)
 1090 LOCAL help$
 1100 IF window%=-1 THEN
 1110  help$="Drop a sprite file on this to sort its sprites"
 1120 ELSE
 1130  CASE icon% OF
 1140   WHEN 0:help$="Click SELECT to sort alphabetically|M0,1,10,11,2,20,3,...A,B,C"
 1150   WHEN 1:help$="Click SELECT to sort numerically|m0,1,2,3,10,11,20,...A,B,C"
 1160  ENDCASE
 1170 ENDIF
 1180 =help$
```

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BBC ACORN USER

NEW KIDS IN THE DOCK

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Never again! Next month we ban adults from our educational reviews and let the kids have their say.

CLIP ART ROUND UP

Animals, banners, cartoons, buildings, cars, computers, plants, insects, famous faces, dinosaurs, bugs and slugs: these are just some of topics covered in that expansive territory known as clip art. We round up some of the best options.

PROGRAMMER'S GUIDE

Over three thousand pages of programming details make up what is now *the* most comprehensive guide to programming in Risc OS 3. Enter the territory of the expert programmer as we try out the new Programmer's Reference Manuals from Acorn.

PLUS

THE COMPLETE GUIDE TO PORTABILTY

We show you how to make the most of computing on the move. Check out our range of Pocket Book software and a selection of Acorn A4 add-ons.

QUICKER DOS?

Acorn's PC Emulator could have a new competitor. *FasterPC* is a package that claims to be faster than the Acorn version without costing a fortune.

STAR STRUCK

Galactical gazing can be an illuminating pastime if you just have a little knowledge to help you along. Next month the latest astronomy program is put through its paces

IN BRIEF

A quick look at the stickiest backdrop and a new powerful editor.

REGULARS

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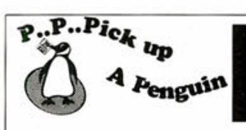
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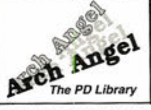
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ACORN USER ADVERTISEMENT PAGES AUGUST 1993

THE MOXON INTERVIEW

ROBIN SAXBY

Arm Ltd is the jewel in the crown of the microprocessor industry. Robin Saxby, managing director of Arm, explains why



JULIAN ANDERSON

Driving to Arm's offices, north of Cambridge, it's hard to square the serenity of the scenery with the cutting-edge technology Arm produces. Arm is the new darling of the microprocessor industry and despite the relaxed atmosphere, it's a hive of activity. According to managing director Robin Saxby, Acorn users have a lot to look forward to this year.

'When we announce the Arm700 in the last quarter, it will have an even higher performance than the 600 family,' he says. 'The Arm700 will be at least twice as fast as an Arm3; it may be higher, but we can't say without actually having a silicon version to test.'

So could this have anything to do with the rumoured new Acorn machine?

'Acorn will definitely be using the Arm700 family in its new range of machines, as well as the Vidc20 video controller. It's safe to say that Acorn will be releasing a range of very good new machines.'

Although the Arm7 hasn't been committed to silicon yet, it's easy to see Robin's point. He showed me an A540 with Vidc20 and a floating point accelerator chip fitted and, believe me, it's fast. Imagine *that* with a new Arm 7.

So what is the relationship like between Acorn and Arm? 'A two-way street. If Arm Ltd is successful, Acorn benefits immensely, not just in terms of finance, but because if more people use Arm chips, it reflects well on Acorn's choice of processor.

'Acorn also brings considerable advantages to us. The fact that there's a customer down the road from us who is using Arm chips practically and successfully is good for us, and Acorn products such as *Replay* help us demonstrate our chips that much more effectively.'

A healthy situation borne out by Acorn's success with the A5000 and A3010. On the other hand, Acorn is just another customer as far as Arm is concerned. Arm Ltd is a joint venture company, with partners Acorn, Apple, VLSI and NIF, and, according to the MD his job is 'to find a common path, mutually beneficial to as many partners as possible'. Arm Ltd designs chips for its customers; the semiconductor licensees (VLSI, GEC Plessey and Texas Instruments) do the selling.

But how do the Arm chips manage to cover such a wide range of applications? The answer lies in the combination of software and hardware which Arm provides with its chips.

Look at the GEC Plessey brochure for the Arm6 family, and you will see a *Platform Independent Evaluation* card (PIE) designed to plug into any computer equipped with an RS232 port. Software support consists of C compiler, assemblers, linkers and other tools to produce Arm code using other platforms, notably PCs and Suns; this support enables existing C code (for example) to be compiled for use with a new processor very quickly.

'Support for Arm products is very good,' assures Robin. 'We have a lead as far as knowledge and expertise go, and as software support becomes more important, that lead will be all the more vital.'

This flexible nature of the Arm chip lends itself to many uses. Acorn's machines have been bringing in royalties from computer sales since day one. The Apple Newton and 3DO multiplayer (which both use Arm chips) will only start to provide income when they go on sale at the end of the summer. Meanwhile, the Texas Instruments deals will come to financial fruition in three to four years, and smart cards (as used by the French telephone service) should prove a massive market by the year 2000. According to Robin 'Arm will be shifting millions of chips next year, and tens of millions in the not-too-distant future.'

But what about the development of the chip range? When Arm Ltd was set up, plans were drawn to chart the proposed development of the company, up to the Arm9. The next step is the release of the Arm7 family, and next year Arm will launch a new Arm7 family member, the Arm7DM, with an improved multiply function for use with, for example, graphics processing.

The future seems clear. 'The Arm8 family, scheduled for 1995, will probably be twice the speed of the Arm7', says Robin, 'and we're hiring new staff to start work on the next range of chips. I've already started to talk to people about the development of the Arm9.'

Following the imminent release of Apple's Newton and the 3DO multiplayer system, are 'a number of other products that involve Arm chips which are just as exciting', he goes on. After only two-and-a-half years in business, Arm Ltd is about to become very big indeed.

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SCHOOL CHILDREN PROVE THAT NEW BYPASS WILL DAMAGE THE LOCAL ENVIRONMENT

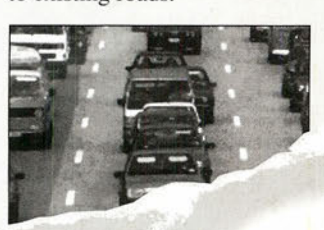
EXCLUSIVE

BY MATTHEW DAVIES

USING an innovative new program on their classroom computer children from St. Chad's School have shown town planners that a proposed new bypass would have a detrimental effect on their local environment.

The children surveyed the local area and fed details into their Topographer program, which allows them to look at the relevant area in 3D. They then added the new road along its proposed route and it became obvious that the road would not only affect an area renowned for its badger population but would also distract children in the classroom as they would be able to see traffic moving along the new road.

The children even went as far as to propose a new route for the road to the town planners. The proposed route would have a negligible impact on the area but still provide the much needed relief to existing roads.



A SERIES of sweeping proposals which would abolish free parking in district shopping centres, change some bin collections, increase lettings charges and scale down mileage claims by some council officers, have been announced by Labour.

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Topographer is a major application for the Geography curriculum which allows children (and teachers) to have lots of fun whilst learning all about maps, contour lines, valleys, rivers etc. In fact *Topographer* covers virtually all items found on a map.

The real break through with *Topographer* is its 3D section which allows you to convert a 2D map into a 3D model on screen. Imagine turning a set of flat contour lines on a 2D map into a 3D model which clearly shows the hill — no more cardboard cut out models or papier mache! You define where you look from, and what you look at.

Topographer also covers aspects of the IT and maths curriculum with its modelling capabilities. Just stop for a minute and think of the projects that you could do with *Topographer*. You could make a map of the local area with churches, pubs, woods etc. and then view it from various places. If there is a bypass proposed you could add it in to the existing landscape and see where it is visible from and what impact it is likely to have on the community. I'm sure you can think of a hundred and one topics.

◆ Fully RISC OS 2 & 3 Compliant and 1 megabyte friendly ◆ Suitable for all ages from 6 onwards ◆ Easy and quick entry of all symbols (over 100) ◆ Wooded areas which translate into impressive 3D landscapes ◆ Definable map size and scale which can be linked to the national grid references ◆ Powerful 3D mode giving a true representation of the landscape ◆ Stunning 3D models which can be saved as a sprite file for use with other applications.

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